Children under Five Years Old with Anemia in Al- Najaf Province, Iraq

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Abstract

One of the most serious public health problems affecting people in both developing and industrialized countries is anemia. 3.5 billion people were reported in developing countries were anemic. This study aims to determine the anemia causes among children under five years in Al-Najaf province. A cross-sectional study was conducted in Al- Furat Al Awsat hospital and Al- Zahra Teaching Hospital for period 3/12/2017- 28/2/ 2018in Al Najaf Al- Ashraf province, Iraq. The sample of this study was selected using simple random sampling. The list of children's names was used to determine the sample. The respondents were the children who were diagnosed with the anemic condition by a pediatrics physician at the place of study. The findings of this study show that 50.9% of respondents were males. Most of them were living in low family income. The primary and secondary levels of education were the level of education of most parents. 63.2% of children were living in urban areas. On the other hand, 18.7% of children have infected with parasitic and 24% of them had chronic diarrhea. 29.2% had a family history with anemia 35.7% of the study sample had anemia. As for the obstetrical history, the mothers who had anemia during pregnancy were represented 60.2%. 31% had bleeding during pregnancy and 35.7% had multiple pregnancy. Finally, this study found that there was a multiple correlation between dependent and independent variables.

Key words: anemia, children under 5 years, Al-Najaf.

Introduction

Anemia is one of the most serious public health problems affecting people in both developing and industrialized countries. In developing countries, it was reported that an estimated 3.5 billion people were anemic (Onis et al., 2000: 1222-1233). In 2008, World Health Organization (WHO) estimated that the prevalence of anemia in Africa was 64.6%, which is higher than the prevalence in Europe (16.4%), and higher than in North America (3.4%) (Benoist et al., 2008; Bogen et al., 2000: 1254). Anemia in children is of particular interest since it impairs their mental, physical and social development; it causes negative behavioral and cognitive effects resulting in poor school performance and work capacity in later years (Villalpando et al., 2003). Iron deficiency is indicated as the most common cause of anemia in under-five children with a smaller proportion due to other micronutrient deficiency such as folate, Vitamin A and B12 (Villalpando, et al., 2003; Fleming, et al., 1982: 161-173).

Several studies have shown that iron deficiency anemia during the first two years of life leads to impairments in the cognitive and behavioral development that persist even after the treatment of iron deficiency (Lozoff, 1991: 687-694; Irwin and Kirchner, 2001: 1379-1386). Despite the serious health and social implications, the prevalence of anemia remains a major public health concern and was indicated as one of the leading causes of infant mortality and morbidity in developing countries, in particular, countries across Africa (Brabin, 2001: 636-648; Koram, 2000: 670-674). For instance, a study of anemia in children along the coast of Tanzania reports a prevalence of 74% (Premji, 1995: 55-64). Another study in the Democratic Republic of Congo estimates a prevalence of 43% (Hedberg, 1993: 365-371). In a study was conducted in Southern Cameroon, the prevalence of children less than 2 years was found (Cornet et al., 1998: 606-611). In other

developing countries, the prevalence of childhood VII anemia ranges from 27.2% in Mexico to 60.6% in Haiti (Villalpando, 2003: 490-498; Ayoya, 2013: 502968).

Iron-deficiency anemia was a major problem in Iran in 2004. It is estimated that about 18% to 38% of Iranian children under 5 years of age were anemic (Bahrami et al., 2004: 149-156). Studies of Middle Eastern populations have shown a high prevalence of anemia and iron deficiency in preschool children (Al Fawaz et al., 1993: 27-31; Kilbride et al., 2000: 231-236). Padmanabhan et al., reported an anemia prevalence was 45.1% in a hospital outpatient for children aged 3-5-year-old Omani children (Padmanabhan et al., 2001: 45-49). In the United Arab Emirates (UAE) city of AL-Ain in 1995, the anemia was reported as 35 % in children aged 6-22 months (Hossain et al., 1995: 227-235). In Iraqi studies the results showed that the prevalence of anemia in preschool-age children was 47.4%, the Iron deficiency was the commonest cause of nutritional anemia, in early childhood, bad feeding habits, especially during the weaning period and suffering from worms are factors leading to nutritional anemia (Kadhum, 2017: 681-689). The objective of this work is to determine the socio-demographical characteristics of children who had anemia and to determine the causes of anemia among children under five years in Al-Najaf province.

Methodology

Design: A cross sectional study.

Timing: Data collection was started on 3/12/2017- 28/2/ 2018.

Setting: This study was conducted in Al- Zahra Teaching Hospital and AL- Furat Al Awsat hospital in Al Najaf Al- Ashraf province.

Sampling

Simple random sampling, was used to select the sample of this study. Name list of children was used to determine the sample. The patient who arrived to the hospitals and diagnosed with anemic condition by pediatrics physician.

Study samples: All children fulfilling the inclusion criteria:

Inclusion criteria:

1-Children under five years who diagnosed with anemia.

2- Living in AL-Najaf province during the period of this study.

Exclusion criteria:

1-Children under five years don't diagnosed with anemia.

2-Children above five years.

3-Children that don't live in AL-Najaf province

Data Collection Tool:

A structured questionnaire was used to elicit the information from the study participants. The questionnaire included the following information:

1. Socio-demographic data: This section includes 5 items of information on the children, mothers', fathers' and educational level of parents and their occupations.

2. Baby status and background information: This section includes information on the weight, height, type of feeding, weaning age, and also information about parasitic or worms' infections of the children.

3. Medical Family history: Include history about anemia among family members, anemia during pregnancy period, taken supplementary drugs, and chronic diseases.

4. Obstetrical history: Include information about mother if she had bad obstetrical history.

5. Diagnosis: That demonstrate type of anemia in children. The questionnaire was filled by the researchers through the direct interviewing with the mothers of children. The

average time that needed to fill the questionnaire form and gather the needed information was 5-10 minutes.

Ethical consideration

Oral consent was taken from all parents of participants.

Official consent was taken from AL-Najaf Health Directorate\Center of Training and development of staffs (ref: No.36830).

Statistical analysis

Statistical Package for the Social Sciences (SPSS) version 23 was used to analyze the data. For descriptive data, the frequencies, percentages, mean and standard deviation, were calculated for selected numerical and categorical variables.

Results

The total number of the respondent was (171) child (Table 1), the response rate was (100%). The results were normally distributed. The age range was (1-60) month with mean ± Std. Deviation 20.3) (15.6 ± 20.3)

Table 1. Distribution of respondents according to sociodemographic characteristics

	Frequency	Percent
Age (year)		
1.00	74	43.3
2.00	42	24.6
3.00	23	13.5
4.00	24	14.0
5.00	8	4.7
Gender		
Male	87	50.9
Female	84	49.1
Residence		
Urban	108	63.2
Rural	63	36.8

The result of this table shows that most of the respondents were in the age of two years (24.6%). As seen at Table 2, the percent of males (50.9%) is higher than females (49.1%). The result of this table shows that the percent of children were living in urban was (63.2%) higher than there were living in a rural area (36.8%).

Table 2. Distribution of respondent according to number of family

No. of Family	Frequency	Percent
2	1	0.6
3	29	17.0
4	35	20.5
5	43	25.1
6	22	12.9
7	20	11.7
8	11	6.4
9	5	2.9
10	3	1.8
11	1	0.6
12	1	0.6

Total	171	100.0

Through this research we found that the number of family (5) is the highest (25.1%) (Table 3).

Table 3. Sociodemographic characteristics of parents of respondents

Items	Mother age		Father age	
Age group	Freq.	%	Freq.	%
16-21 y	18	10.5	8	4.7
22-27 y	38	22.2	34	19.9
28-33 y	52	30.4	46	26.9
34-39 y	42	24.6	35	20.5
40-45 y	19	11.1	35	20.5
≤52	2	1.2	13	7.6
Educational Levels				
Not read and not write	20	11.7	25	14.6
primary level	38	22.2	53	31.0
secondary level	34	19.9	32	18.7
Tertiary level	26	15.2	26	15.2
Diploma	30	17.5	21	12.3
Bachelor	19	11.1	13	7.6
Master	4	2.3	1	.6
Jobs				
Not working	129	75.4	12	7.0
Elementary occupations	4	2.3	1	.6
Armed forces	2	1.2	10	5.8
Legislators, senior officials, and managers	11	6.4	4	2.3
Professionals	5	2.9	1	.6
Technicians and associate professionals	7	4.1	6	3.5
Clerks	13	7.6	40	23.4
Service workers, shop, market sales workers	0	0.0	56	32.7
Skilled agriculture and fishery workers	0	0.0	16	9.4
Craft and related trades workers	0	0.0	19	11.1
Plant and machine operator assemblers	0	0.0	6	3.5

The result of this table shows that most of the parents were in the age group (28-33) years. According to family income, the range of family income was (150,000-2,000,000) IQD with mean ± Std. Deviation (18115.4 ± 131595.9) IQD. As for the parent's educational level, most of the parents were at the primary educational level (22.2%) for fathers and (31.0%) for mothers. According to the parent's jobs of respondents, the results of this table reveals that the percent of fathers who working in "service workers, shop and market sales workers" was (32.7%), either the percent of mothers who not working was (75.4%) than mothers is working (Table 4).

Table 4. Distribution of respondents according to exclusive BF per months, weaning age, extra food and type of feeding

Duration of exclusive BF	Frequency	%
Non	61	35.7
1	4	2.3
2	12	7.0
3	14	8.2
4	5	2.9
5	3	1.8
6	17	9.9
7	1	.6
8	8	4.7
9	5	2.9
10	3	1.8
12	11	6.4
14	3	1.8
16	1	.6
18	13	7.6
24	10	5.8
Weaning age		
Non	95	55.6
1	5	2.9
2	2	1.2
3	1	.6
4	1	.6
6	5	2.9
8	3	1.8
9	3	1.8
12	13	7.6
16	1	.6
18	18	10.5
20	3	1.8
24	21	12.3
Extra food		
Yes	102	59.6
No	69	40.4
Type of feeding		
Breast feeding only	62	36.3
Bottle feeding only	39	22.8
Mixed	70	40.9

The findings in this table show that the percent of children who don't take exclusive breastfeeding was (35.7%). According to weaning age, the result of this table shows that the percent of children don't wean was (55.6%). As for extra food, this table explained that the percent of children who take extra food was high (59.6%). According to the type of feeding, the percent of mixed-method was the most way for feeding (40%) (Table 5).

Table 5. Distribution of respondent according to mother status

Baby status	Frequency	Percent
Parasitic & worms infection	32	18.7
Chronic diarrhea	41	24.0
Anemia among family	50	29.2
Previous child has anemia	61	35.7
IDA	136	79.5
Thalassemia	31	18.1
Sickle cell anemia	4	2.3
Mother status		
Anemia during pregnancy	103	60.2
Mother taken ferfol	120	70.2
Mother bleeding during pregnancy	53	31.0
Mother has multiple pregnancy	61	35.7
Type of chronic disease		
Non	149	87.1
HTN	9	5.3
Diabetes	7	4.1
Epilepsy	1	0.6
Asthma	4	2.3
Peptic Ulcer	1	0.6
Mother hereditary diseases		
Non	91	53.2
HTN	34	19.9
Diabetes	30	17.5
Hemophilia	1	0.6
HTN & Diabetes	14	8.2
Ca deficiency	1	0.6
Bad obstetrical history	Frequency	Percent
1st trimester miscarriage	29	17.0
2nd trimester miscarriage	29	17.0
Still births	10	5.8
Neonatal deaths	5	2.9
Pre-term labor	5	2.9

The results in the above table show that the children with anemia who have the previous children had anemia were (35.7%). Follow them by the children with anemia and they have anemia among their families were (29.2%). The children with anemia and they had chronic diarrhea were (24.0%). Finally, the children with anemia who had parasitic & worm's infections were (18.7%). This table also reveals that the mothers who had anemia during pregnancy were (60.2%). The mothers who had bleeding during pregnancy were (31.0%). The mothers who had multiple pregnancy were (35.7%). Table 6 shows that (17.0%) was at 1st trimester miscarriage & 2nd-trimester miscarriage.

Table 6. Distribution of parents according to the chronic disease

Parents status	Frequency	Percent
Chronic mother diseases	21	12.3

Chronic father diseases	32	18.7

According to parents' status in this table, the percent of mothers who have chronic diseases was (12.3%). The percent of fathers who have chronic diseases was (18.7%).

Correlation table between dependent and independent variables

There is a highly significant correlation at level (0.01) between age and (weight, height, duration of exclusive breastfeeding, weaning age, extra food, age of extra food, parasitic and worm infections, diagnosis,) and there is a significant correlation at level (0.05) between age and (type of father chronic diseases, mother taken Ferfol).

There is a highly significant correlation at level (0.01) between No. of family and (Sequence, mother age group, father age group, duration of exclusive breastfeeding, mother multiple pregnancy, bad obstetrical history) and there is significant correlation at level (0.05) between No. of family and (anemia during pregnancy, age of extra food). There is a significant correlation at level (0.05) between residences and extra food.

There is a highly significant correlation at level (0.01) between father & mother age and (No. of family, sequence, mother multiple pregnancy, bad obstetrical history) and there is a significant correlation at level (0.05) between mother age and (mother chronic diseases, father chronic diseases). There is a significant correlation at level (0.05) between family income and (age of extra food).

There is a highly significant correlation at level (0.01) between birth weight and (weight, height) and there is a significant correlation at level (0.05) between birth weight and (anemia during pregnancy). There is a highly significant correlation at level (0.01) between weight and (age, birth weight, height, weaning age, extra food, age of extra food, parasitic and worm's infections) and there is a significant correlation at level (0.05) between weight and (duration of exclusive breastfeeding, diagnosis).

There is a highly significant correlation at level (0.01) between duration of exclusive breastfeeding and (age, No. of family, weight, height, weaning age, extra food, age of extra food) and there is significant correlation at level (0.05) between duration of exclusive breastfeeding and (sequence, parasitic and worms' infections). There is a highly significant correlation at level (0.01) between weaning age and (age, weight, height, duration of exclusive breastfeeding, extra food, age of extra food) and there is a significant correlation at level (0.05) between weaning age and (parasitic and worms' infections, previous child anemia, type of father chronic diseases, mother taken Ferfol) .

Discussion

The finding of this study shows that the abnormal hemoglobin level was (50.9%) of males and (49.1%) of females. These findings agree with study was done in America (Konstantyner, 2011). The percentage of IDA in this study was 79.5%. This result is higher than what found by Pittsburg study (8%) (Debra et al., 2000), and other study that was done in the United State which shows that the percentage of IDA was (3%) among toddlers (1-2 y) and (7%) among the ages (3- 5y) (Looker et al., 1997: 973-976; Eden and Sandoval, 2012: 704-709). These results also indicate that IDA is still a major problem in our country which is maybe due to wrong beliefs by some families that added a solid diet should not be given before the age of 1 year. In addition, this leads to the depletion of the body iron store as the storage of body iron is only enough for the first 4-6 months of age (Behrman et al., 2000: 23-61; Henry, 1988: 386). Regarding to the age, the results of this study demonstrated that the higher percentage was in the age group (>1yr) (43.3%), this results are dissimilar to Pittsburg study which shows that result was not significantly different by age (Debra, et al., 2000), This may be due to the same

reasons above about the time families should introduce added solid diet to their babies as exclusive breastfeeding or formula feeding is only enough for the first 4-6 month of age (William, et al., 1993). The finding of the present study indicated that the percentage of anemia among children under five years there was not highly differencing between male (50.9%) and female (49.1%), this result is not agreement with the study was conducted in Burma (Zhao et al., 2012: 326-411). This issue is maybe due to the difference in sample 25 size. Regarding the residence, the results in this study demonstrated that the higher percentage was in the urban area (63.2%) and this may be related to a number of reasons such as environment and population. So, these agree with the study done by Barakat (2013: 168-177) .

According to the educational level, the results of this found that the primary level of fathers was (22.2%), and mothers were (31%). Related to feeding, mixing feeding had a higher percentage (40.9%). This doesn't agree with the study done by Horta, their study recorded (24%) in both mixing and artificial feeding (Horta, et al., 2013: 23). A higher percentage recorded in aged less than one year (43.3%) and artificial feeding was (22.8%). This doesn't agree with the study done by Shaw and Friedman, they found that the percentage is (10.3%) (Shaw and Friedman, 2011). In the time of supplement food, the introduction of other liquid or solid foods during the first six months of life can interfere with the absorption of iron from breast milk, the results of this study found that the highest percentage (59.6%) of children who started taking supplement food in the first six months. The finding of the present study is an agreement with findings were reported in the study conducted in Burma (Staltzfus, 2014), and supported by another study by Carvalho, they found that (65.4%). Finally, our study shows that (18.7%) of children were suffering from worms, this maybe leads to anemia, because these worms nourished on blood and nutrients of children then it will decrease absorption of iron and food in their bodies.

Conclusions

This study found that most of the respondents were male (50.9%). Most of them were living in low family income. The highest percentages of the parents had a primary and secondary level of education. According to the residence, it's found that 63.2% was from urban areas. On the other hand, found that 18.7% had a parasitic infection, 24% had chronic diarrhea, 29.2% had a family history with anemia and 35.7% had anemia. According to the obstetrical history, 60.2% of mothers had anemia during pregnancy, 31% had bleeding during pregnancy and 35.7% had multiple pregnancy. Finally, this study found that there was a multiple correlation between dependent and independent variables.

Recommendations for treatment:

When Iron Deficiency Anemia is identified, the family should be counseled regarding the importance of limiting the total daily milk intake and increasing iron-rich foods, including those with vitamin C that improves iron absorption, and avoiding foods that impair iron absorption such as tea, Pepsi. Children with IDA should also receive iron supplementation.

The prevention and the control of anemia should be given immediate priority in the health and nutrition sectors particularly preschool children who are not currently the target of anemia-prevention.

References

Al Fawaz, I.M. (1993). Surveillance for iron deficiency anaemia at a well-baby clinic in Riyadh, Saudi Arabia. Saudi Medical Journal, 14(1), 27-31.

Ayoya, M.A., Ngnie-Teta, I., Séraphin, M.N., Mamadoultaibou, A., Boldon, E., Saint-Fleur, J.E., Bernard, S. (2013). Prevalence and risk factors of anemia among children 6–59 months old in Haiti. Anemia, 502968. https://www.doi.org/10.1155/2013/502968

Bahrami, M.A. (2004). Malnutrition and its effects on development in Iranian children. Iranian Journal of Pediatrics, 14(2), 149-156.

Barakat, A.A., Nada, K.H., Ezzat, D.A. (2013). Prevalence and determining factors of anemia and malnutrition among egyptian children. Indian J Med Sci., 67(7-8), 168-177. https://www.doi.org/10.4103/0019-5359.125878

Behrman, R.E., Kliegman, R.M., Jenson, H.B. (2000). Textbook of Pediatrics, 16th. America: WB Sounders Company.

Benoist, B.D., McLean, E., Egll, I., Cogswell, M. (2008). Worldwide prevalence of anaemia 1993-2005: WHO global database on anaemia. Worldwide prevalence of anaemia 1993-2005. Available at: https://apps.who.int/iris/bitstream/handle/10665/43894/9789241596657_eng.pdf

Bogen, D.L., Duggan, A.K., Dover, G.J., Wilson, M.H. (2000). Screening for iron deficiency anemia by dietary history in a high-risk population. Pediatrics, 105(6), 1254-1259. https://www.doi.org/10.1542/peds.105.6.1254

Brabin, B.J., Premji, Z., Verhoeff, F. (2001). An analysis of anemia and child mortality. The Journal of nutrition, 131(2), 636-648. https://www.doi.org/10.1093/jn/131.2.636S

Cornet, M., Le Hesran, J.Y., Fievet, N., Cot, M., Personne, P., Gounoue, R., Deloron, P. (1998). Prevalence of and risk factors for anemia in young children in southern Cameroon. The American journal of tropical medicine and hygiene, 58(5), 606-611. https://www.doi.org/10.4269/ajtmh.1998.58.606

Eden, A.N., Sandoval, C. (2012). Iron deficiency in infants and toddlers in the United States. Pediatric hematology and oncology, 29(8), 704-709. https://www.doi.org/10.3109/08880018.2012.725199

Fleming, A.F., Werblińska, B. (1982). Anaemia in childhood in the guinea savanna of Nigeria. Annals of Tropical Paediatrics, 2(4), 161-173. https://doi.org/10.1080/02724936.1982.11748250

Hedberg, K., Shaffer, N., Davachi, F., Hightower, A., Lyamba, B., Paluku, K. M., & Breman, J. G. (1993). Plasmodium falciparum-associated anemia in children at a large urban hospital in Zaire. The American journal of tropical medicine and hygiene, 48(3), 365-371. https://doi.org/10.4269/ajtmh.1993.48.365

Henry, R.J. (1988). Serum iron .Clinical chemistry Principals and Tech., 6th ed .New York, Harper and Row.

Horta, B.L., Santos, R.V., Welch, J.R., Cardoso, A., dos Santos, J.V., Assis, A.M., Lira, P.C., Coimbra, C.E. Jr. (2013). Nutritional status of indigenous children: findings from the First National Survey of Indigenous People's Health and Nutrition in Brazil. Int. J Equity Health, 12, 23. https://doi.org/10.1186/1475-9276-12-23

Hossain, M.M., Bakir, M., Pugh, R.N.H., Sheekh-Hussen, M., Ishaq, S.B., Berg, D.B., Lindblad, B.S. (1995). The prevalence and correlates of anaemia among young children and women of childbearing age in Al Ain, United Arab Emirates. Annals of tropical paediatrics, 15(3), 227-235. https://doi.org/10.1080/02724936.1995.11747777

Irwin, J.J., Kirchner, J.T. (2001). Anemia in children. American family physician, 64(8), 1379-1386.

Kadhum, S.A. (2017). Knowledge of mothers about nutritional anemia in children under five years in Baghdad city. International Journal of ChemTech Research, 10(9), 681-689. Available at: http://sphinxsai.com/2017/ch_vol10_no9/abstracts/A(681-689)V10N9CT.pdf

Kilbride, J., Baker, T.G., Parapia, L.A., Khoury, S.A. (2000). Incidence of iron-deficiency anaemia in infants in a prospective study in Jordan. European journal of haematology, 64(4), 231-236. https://doi.org/10.1034/j.1600-0609.2000.9o037.x

Koram, K.A., Owusu-Agyei, S., Utz, G., Binka, F.N., Baird, J.K., Hoffman, S.L., Nkrumah, F.K. (2000). Severe anemia in young children after high and low malaria transmission seasons in the Kassena-Nankana district of northern Ghana. The American journal of tropical medicine and hygiene, 62(6), 670-674. https://doi.org/10.4269/ajtmh.2000.62.670

Looker, A.C., Dallman, P.R., Carroll, M.D., Gunter, E.W., Johnson, C.L. (1997). Prevalence of iron deficiency in the United States. JAMA-Journal of the American Medical Association-International Edition, 277(12), 973-976. https://doi.org/10.1001/jama.1997.03540360041028

Lozoff, B., Jimenez, E., Wolf, A.W. (1991). Long-term developmental outcome of infants with iron deficiency. New England journal of medicine, 325(10), 687-694. https://doi.org/10.1056/NEJM199109053251004

Onis, M.D., Frongillo, E.A., Blössner, M. (2000). Is malnutrition declining? An analysis of changes in levels of child malnutrition since 1980. Bulletin of the World Health Organization, 78, 1222-1233.

Padmanabhan, A., Thomas, S., Sheth, H., Venugopalan, P. (2001). High prevalence of microcytic anaemia in Omani children: a prospective study. Annals of tropical paediatrics, 21(1), 45-49.

Premji, Z., Hamisi, Y., Shiff, C., Minjas, J., Lubega, P., Makwaya, C. (1995). Anaemia and Plasmodium falciparum infections among young children in an holoendemic area, Bagamoyo, Tanzania. Acta tropica, 59(1), 55-64. https://doi.org/10.1016/0001-706x(94)00079-g

Shaw, J.G., Friedman, J.F. (2011). Iron deficiency anemia: focus on infectious diseases in lesser developed countries. Anemia, 260380. https://doi.org/10.1155/2011/260380

Stoltzfus, R.J. (2008). Research needed to strengthen science and programs for the control of iron deficiency and its consequences in young children. The Journal of nutrition, 138(12), 2542-2546. https://doi.org/10.3945/jn.108.094888

Villalpando, S., Shamah-Levy, T., Ramírez-Silva, C.I., Mejía-Rodríguez, F., Rivera, J.A. (2003). Prevalence of anemia in children 1 to 12 years of age: results from a nationwide probabilistic survey in Mexico. Salud pública de México, 45, 490-498. https://doi.org/10.1590/s0036-36342003001000005

Zhao, A., Zhang, Y., Peng, Y., Yang, T., Wing, P. (2012). Prevalence of anemia and its risk factor among children 6-36 months old in Burma Am. J. Trop. Med.Hyg., 87(2), 326-411. https://doi.org/10.4269/ajtmh.2012.11-0660