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CHILDHOOD ANAEMIA IN ONDO, SOUTH-WEST NIGERIA**

MATERNAL PERCEPTION, KNOWLEDGE AND HEALTH - SEEKING BEHAVIOUR OF CHILDHOOD ANAEMIA IN ONDO, SOUTH-WEST NIGERIA

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ABSTRACT

Introduction: Anaemia is a condition that affects a significant number of children under the age of five in Nigeria. The perception, knowledge, and health-seeking behaviours of mothers can play a crucial role in the early detection and management of childhood anaemia. This cross-sectional study aimed to investigate the perception, knowledge, and health-seeking behavior of mothers towards childhood anaemia in Ondo, South-West, Nigeria.

Method: The study was conducted at the University of Medical Sciences Teaching Hospital, Ondo. Pre-tested standardized questionnaires were used to collect data on maternal perception, knowledge, and health-seeking behaviour of 384 mothers. Data was analyzed using SPSS version 21.

Results: Most of the mothers have good knowledge, perception and health-seeking behaviour towards childhood anaemia, with mean scores of 19.6, 41.9 and 25.5 respectively. Knowledge about causes, symptoms, consequences, and prevention of anaemia was lowest in the youngest group of women (18-29yrs). Maternal knowledge, perception, and health-seeking behaviour in general, increased with age. Age, level of education, and religion, were associated with maternal knowledge and perception (p values <0.05). Concerns for the impact of the disease on the family, influence of what friends and relatives expect one to do and knowledge of

what to do were the significant predictors of health-seeking behaviour of the mothers.

Conclusion: Overall, the study highlights the need for targeted health education programs towards improving maternal knowledge and health-seeking behaviors of childhood anaemia in Nigeria; this would lead to early detection and management of the disease, thus reducing associated morbidity and mortality.

Keywords: Anaemia, childhood, health-seeking behaviour, knowledge, maternal, perception.

INTRODUCTION

Anaemia is characterized by a reduction in the oxygen carrying capacity of the blood due to decrease in haemoglobin concentration and red blood cell volume.¹ It results in the inability of the body to meet its physiologic needs.

Over the years, anaemia continues to be a significant public health problem. It is a major cause of childhood mortality, and it is associated with significant neurocognitive impairment as well as impairment in growth and development in children.^{2,3} Severe anaemia accounts for a significant percentage of mortality in children in the emergency room.^{3,4} Delayed presentation for healthcare and accessibility to blood contributes to mortality seen among them, hence the importance of seeking timely health intervention has been widely reiterated.⁵

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According to Ferdous et al. appropriate and timely health-seeking behaviours can reduce mortality in several children who died before reaching healthcare facilities.⁶ A WHO report attributed 70% of child deaths to delayed health-seeking.⁶

Studies have shown varied prevalence of anaemia as 67.0%, 15.0%, 57.1% and 40.0% in children under five years of age.⁷⁻¹⁰ Despite the perceived dangers associated with anaemia, there is no appreciable decline in mortality resulting from it over the years. This is particularly so in countries with high malaria endemicity, where lots of preventable deaths occur among the under—five, due to severe anaemia.^{3,4}

Maternal perception, knowledge, and health-seeking behavior are crucial in the prevention and management of childhood anaemia. Many studies have considered the perception, knowledge and awareness of anaemia in mothers, especially pregnant women, while fewer studies have been done to consider the maternal perception and knowledge of anaemia in children.¹¹⁻¹³ Anokye et al. in their study found that maternal education and number of children were associated with perception of childhood anaemia while Sougandis et al. associated higher level of education with lower odds of childhood anaemia.^{14,15} Maternal perception and knowledge of childhood anaemia may have significant impact on early detection of anaemia, as well as their health care seeking behaviours/decisions.¹⁶

Knowledge of anaemia or maternal health literacy regarding the disease would provide opportunity to improve health/intervention outcomes.¹⁷ According to WHO, this literacy or knowledge goes beyond schooling or education but includes approaches and information that enhances capacities of people and motivate them to access and use such knowledge to improve and acquire good health outcomes.¹⁷ An understanding of how anaemia is perceived by mothers as well as their knowledge may provide information that will help to ameliorate and reduce the prevalence of the disease in children, and especially the severe form which is often

associated with mortality and largely characterized by late presentation to the healthcare facilities.

The survival of a child with anaemia might be related to the maternal perception and knowledge of childhood anaemia as well as their health seeking behaviour. Prompt blood transfusion for a child with severe anaemia is lifesaving. Prompt health seeking behavior for a child with anaemia may be invariably influenced by maternal perception and knowledge of anaemia. Early detection and prompt treatment of anaemia and its causes might also reduce the need for blood transfusion in children with anaemia. This study seeks to investigate the perception, knowledge, and health-seeking behaviour of mothers towards childhood anaemia, explore associations that might exist between sociodemographic status and maternal knowledge, perception, health-seeking behaviour; and determine factors that influence the mothers' health-seeking behaviour.

METHODS

This cross-sectional study was conducted at the University of Medical Sciences Teaching Hospital, Ondo South-West, Nigeria, among 384 mothers. The participants were mothers seeking health care for their children at the out-patient clinics of the hospital. Participants were consecutively recruited through a simple random sampling. The study was conducted from February 2021 to April 2021. Though, population size of the Ondo South senatorial district is finite but because the degree of its variability is not known, Cochran¹⁸ formula was used to calculate a representative sample. The estimate sample size for this study was calculated as 384. The study assumed maximum variability of the population to be 50% (i.e. $p = 0.5$) in accordance to Cochran recommendation; and taking 95% confidence level $\pm 5\%$ permissible error or precision level. Using the formula:

$$N = z^2pq/e^2$$

Where:

N = sample size;

Z = the selected critical value of the desired confidence level;

P = proportion of variability of attribute present in the population;

Q = standard deviation which equals to $(1-p)$ and.

E = the desired level of precision which can either be 5% or 10% allowed for a reliable empirical study (Cochran)

At 95% confidence level, 5% permissible error and variability proportion of 50%.

Z = 1.96, e = 0.05 and p = 0.05 respectively.

Hence, $q = (1-p) = (1-0.5) = 0.5$

N calculated therefore = $(1.96)^2(0.5) (0.5) / (0.05)^2 = 384.16 = 384$.

Pre-tested standardized questionnaires were used for data collection. The questionnaires were administered by the principal investigator and other researchers trained in data collection for this study. The questionnaire had three sections: maternal knowledge, maternal perception, and health seeking behavior of childhood anaemia. They were adjudged with two-point scale of good and poor. The total obtainable score (for correct answers) for each participant from the measurement scale in each of the three sections was 37, 60 and 35 respectively. Scores above average (18.5, 30 and 17.5 respectively) were considered good, for each parameter being investigated while scores below the average scores were considered poor. The researchers had a face-to-face interview with respondents for the administration of the questionnaires. Informed consent was obtained from the respondents. Ethical clearance was obtained from the Research and Ethical Committee of the Institution. Data was analyzed using SPSS version 21.

RESULTS

Table 1 shows that most of the mothers were within the 18-39 years age group and were mostly businesswomen and have formal education, 76.6%

Table I: Demographic Characteristics of the subjects

		Frequency	Percent
Age	18-29	120	31.3
	30-39	173	45.1
	40-49	73	19.0
	50-59	13	3.4
	≥60	5	1.3
Occupation	Civil servant (senior)	89	23.2
	Civil servant (junior)	77	20.1
	Business (large scale)	96	25.0
	Petty trader	90	23.4
	Unemployed	32	8.3
Level of education	Tertiary	209	54.4
	Secondary	124	32.3
	Primary	29	7.6
	No Formal Education	22	5.7
Religion	Christianity	325	84.6
	Muslim	54	14.1
	Traditional	5	1.3
	Single	69	18.0
	Married	294	76.6
	Divorced	2	.5
	Widowed/Separated	19	4.9
Number of children		100	26.0
	1		
	2	126	32.8
	3	98	25.5
	4	43	11.2
	More than 4	17	4.4
Monthly income bracket	10,000 –N30,000	82	21.4
	31,000–N50,000	43	11.2
	51,000–70,000	84	21.9
	71,000-90,000	42	10.9
	91,000-110,000	78	20.3
	above 110,000	55	14.3

Mean score for maternal knowledge was 19.6; maternal perception, 41.9 while mothers' health-seeking behaviors mean score was 23.5 as shown in Table II. The mean score of 19.6

shows good knowledge; mean score of 41.9 for perception was also good and, the mean score of 23.5 for health seeking behaviour was good (according to the two-point rating standard for the constructs).

TABLE II: Maternal Knowledge, Perception and Health-seeking behavior of Anaemia

	N	Mean	Std. Deviation	Std. Error
Maternal Knowledge of Anaemia	384	19.6120	4.94439	.25232
Maternal Perception of Anaemia	384	41.8594	9.11579	.46519
Health seeking behaviour	384	23.4844	6.59652	.33663

Maternal knowledge and maternal perception are shown in percentages in Tables III and IV respectively.

Table V shows that maternal knowledge, maternal perception and health-seeking behaviour increased with age. However a decline in maternal knowledge was noted in the 50-59 and 60 and above age group.

Concern for impact of the disease on the family, influence of expectations from friends and relatives and knowledge of what to do, were the significant determinants of health-seeking behaviour of the mothers ($p < 0.05$ respectively). Adjusted R Square = 0.918 and the individual effect sizes were 42.9% ($\beta = .429$), 42.9% ($\beta = .429$) and 44.9% ($\beta = .449$) respectively. (Table VI).

Table VII illustrates that age, occupation, level of education, religion, and number of children showed significant association with maternal knowledge and perception (p value ≤ 0.05). Marital status had significant association (p value ≤ 0.05) with the mothers' health-seeking behaviour.

TABLE III: Knowledge of anaemia

	Frequency	Percent
Have you heard about anaemia?		
Yes	238	62.0
No	146	38.0
Total	364	100.0
Do you have access to information about anaemia in children?		
Yes	61	15.9
No	323	84.1
Total	384	100.0
If Yes, which of these is your source (s) of information?		
Hospital or health care centers	15	24.6
Mass media	5	8.2
Friends or relatives	12	19.7
Hospital or health care centres and mass media	8	13.1
Hospital or healthcare centres and Friends or relatives	10	16.4
Hospital or healthcare centres, mass media and Friends or relatives	2	3.3
Mass media and Friends or relatives	7	11.4
Others	2	3.3
Total	61	100.0
Which of these cause(s) anaemia in children?		
Wrong options	31	8.1
1 right option	154	40.1
2 right options	63	16.4
3 right options	45	11.7
4 right options	30	7.8
5 right options	28	7.3
6 right options	33	8.6
Total	384	100.0
Which of these are features/ symptoms of anaemia?		
Wrong options	24	6.3
1 right option	165	43.0
2 right options	87	22.7
3 right options	43	11.2
4 right options	32	8.3
5 right options	16	4.2
6 right options	9	2.3
7 right options	5	1.8
8 right options	3	.5
Which of these are ways to prevent anaemia in children?		
Wrong options	35	9.2
1 right option	154	40.1
2 right options	33	8.6
3 right options	61	15.9
4 right options	70	18.2
5 right options	31	8.1
Which of these are consequences of anaemia in children?		
No option	1	.3
1 right answer	278	72.4
2 right option	34	8.9
3 right option	71	18.5

Table IV: Perception of anaemia

	Frequency	Percent
Anaemia is a common disease in children		
Not sure	37	9.6
Strongly disagree	7	1.8
Disagree	46	12.0
Agree	175	45.6
Strongly agree	119	31.0
Anaemia has adverse consequences in children		
Not sure	42	10.9
Strongly disagree	2	.5
Disagree	15	3.9
Agree	184	47.9
Strongly agree	141	36.7
Anaemia can be treated and cured in children		
Not sure	19	4.9
Strongly disagree	15	3.9
Disagree	12	3.1
Agree	181	47.1
Strongly agree	157	40.9
Prevention of anaemia in children is not possible		
Not sure	38	9.9
Strongly agree	18	4.7
Agree	22	5.7
Disagree	234	60.9
Strongly disagree	72	18.8
Anaemia is an health issue that does not need medical attention		
Not sure	38	9.9
Strongly agree	6	1.6
Agree	15	3.9
Disagree	206	53.6
Strongly disagree	119	31.0
Anaemia cases are work of evil people		
Not sure	47	12.2
Strongly agree	35	9.1
Agree	40	10.4
Disagree	160	41.7
Strongly disagree	102	26.6

A child with anaemia is sure to die		
Not sure	46	12.0
Strongly agree	67	17.4
Agree	91	23.7
Disagree	115	29.9
Strongly disagree	65	16.9
Anaemia occurs more with girls		
Not sure	116	30.2
Strongly agree	22	5.7
Agree	52	13.5
Disagree	128	33.3
Strongly disagree	66	17.2
Anaemia occurs more with boys		
Not sure	111	28.9
Strongly agree	19	4.9
Agree	57	14.8
Disagree	134	34.9
Strongly disagree	63	16.4
Anaemia occurs more among people with low income		
Not sure	66	17.2
Strongly disagree	57	14.8
Disagree	106	27.6
Agree	101	26.3
Strongly agree	54	14.1
Anaemia is a disease of the children of the rich		
Not sure	67	17.4
Strongly agree	17	4.4
Agree	58	15.1
Disagree	152	39.6
Strongly disagree	90	23.4
Anaemia happen in children by chance		
Not sure	99	25.8
Strongly agree	47	12.2
Agree	120	31.3
Disagree	88	22.9
Strongly disagree	30	7.8

Table V: Mean scores of Maternal Knowledge, Perception and Health-seeking Behaviour Based on Age

Age		N	Mean	Std. Deviation
18-29	Knowledge	120	17.2000	4.49444
	Perception	120	29.4000	16.92040
	Health-seeking behaviour	120	22.4104	6.47529
30-39	Knowledge	173	18.6154	5.57582
	Perception	173	42.2466	8.59551
	Health-seeking behaviour	173	23.7808	6.41449
40-49	Knowledge	73	20.1676	5.13998
	Perception	73	43.3353	7.93086
	Health-seeking behaviour	73	24.3083	6.89635
50-59	Knowledge	13	19.3699	4.98472
	Perception	13	44.4615	10.49298
	Health-seeking behaviour	13	27.5385	4.07462
60 & above	Knowledge	5	19.1667	4.53989
	Perception	5	39.7333	9.79945
	Health-seeking behaviour	5	26.0000	5.00000

Table VII: Association of demographic characteristics of the mothers with maternal knowledge and perception of anaemia, health seeking behaviour

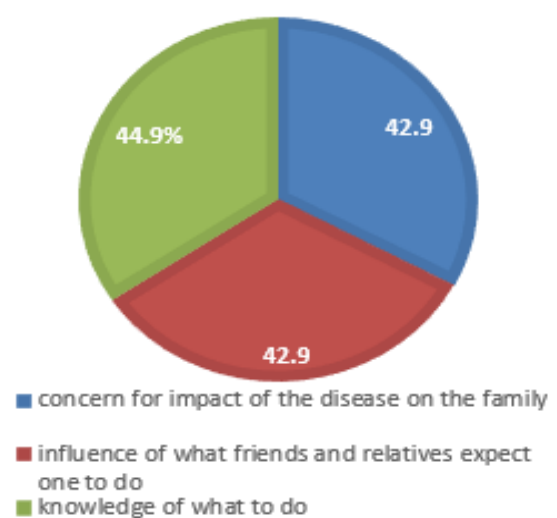
N = 384		Know ledge	Perce ption	Behaviou r
Age	Pearson r		.221	.030
	Sig.	.237	.046	.558
Occupation	Pearson r	.101	-.107	.018
	Sig.	.043	.036	.730
Education	Pearson r	.277	.291	-.011
	Sig.	.000	.000	.827
Religion	Pearson r	.109	-.111	-.014
	Sig.	.032	.029	.790
Marital Status	Pearson r	.002	-.053	.101
	Sig.	.970	.303	.048
Number of children	Pearson r	.104	.103	.024
	Sig.	.032	.041	.639
Monthly income	Pearson r	.094	.008	-.074
	Sig.	.065	.875	.149

TABLE VI: Determinants of Health Seeking Behaviour of the Mothers

Unstandardized Coefficients	Standardized Coefficients	t	Sig.
B	Std. Error	Beta	
Maternal Knowledge of Anaemia			
.032	.026	.018	1.210
Maternal Perception of Anaemia			
-.023	.014	-.025	-1.652
Concern for impact on the family			
1.179	.054	.429	21.825
Acceptance of Western healthcare			
-.306	.274	-.081	-1.118
Influence of what friends and relatives expect one to do			
1.446	.081	.429	17.890
Knowledge of what to do			
1.265	.195	.449	6.479

Adjusted R Square = 0.918

Figure 1 shows a pie chart description of the significant predicting factors of health-seeking behaviour of the mothers and their contributions (effect sizes) in percentages, while figure 2 in bar chart illustrates significant and non-significant predicting factors of health seeking behaviour of the mothers and their contributions.

**Figure 1:** Significant Predicting Factors of Health Seeking Behaviour of the Mothers and their Contributions

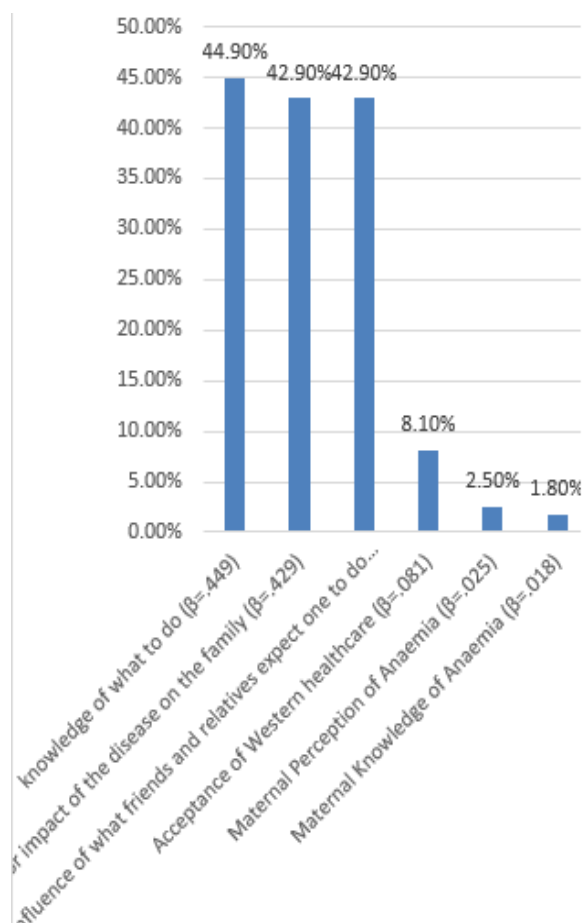


Figure 2: Significant and Non-significant Factors of Health Seeking Behaviour of the Mothers and their Contributions

DISCUSSION

Knowledge and perception of childhood anaemia are essential for mothers, as early detection and intervention are critical to prevent complications associated with the disease. Most of the mothers from this study are within the 18-39 years age group (76.14%). This group had the poorest knowledge of the disease. This suggests that children of younger mothers are more likely to have anaemia than those of older mothers. This might be related to their limited knowledge due to lack of prior experience with cases of anaemia in children. This finding is in line with some earlier studies.¹⁹⁻²¹ Age in this study also showed significant linear correlation with maternal knowledge and perception of anaemia and this might explain the higher knowledge seen among the older women.

The mothers' knowledge of anaemia was

generally middling from the research findings. Though more than half (62%) of them were aware of the disease, only 15.9% (61) have accessed information about the disease, 15.9% have passable knowledge about causes, 23.7% have some knowledge on the signs and symptoms, and 26.3% have adequate knowledge on ways to prevent anaemia in children while only 18.5% of the mothers have appropriate knowledge on the consequences of anaemia in children. This study observed that high proportion of the mothers (64.6%, 72%, 57.8% and 72.7%) have little knowledge on causes, signs and symptoms, prevention and consequences of childhood anaemia respectively. These findings are in line with a study by Yadav et al. who reported poor knowledge regarding causes of anaemia.¹³ It however contrasts with findings of Reindolf et al. and that of Adams et al. who stated that more than 60% of mothers knew symptoms of anaemia in their study.^{21,22}

Formal education, a vantage privilege, is expected to bear some advantages for mothers to know more to the profits of their children. This is affirmed by scholars.²³ Findings of this study indicates that 94.3% of the mothers have formal education, so its contribution to knowledge about childhood anaemia and its prevention is expected to be well above average, but for the presence of predominantly young mothers in this study who were discovered with poorest knowledge. Some studies have demonstrated an association between mothers with formal education and higher knowledge of causes, symptoms and preventions of anaemia in children, and mothers with no formal education and poor knowledge with higher likelihood of anaemia in children.²⁴⁻²⁷ Education from this research showed the strongest significant positive correlation with maternal knowledge and perception of anaemia ($p<0.05$ respectively). This is in line with the submission of Reindolf et al.²¹

Maternal perception of childhood anaemia was generally good (mean score, 41.9), well above average score on the rating scale (table 2). However, knowledge of what to do rather

than maternal knowledge of the disease was found to have a significant influence on maternal health-seeking behaviour. This finding is averse to Souganidis et al.'s submission that maternal knowledge of anaemia is a key significant influence to healthcare behaviours of mothers.¹⁵

The mothers have good health-seeking behavior, mean score 23.5 was higher than average score on rating scale. Concern for impact of the disease on the family, influence of what friends and relatives expect one to do and knowledge of what to do came up to be the significant determinants of health-seeking behaviour of the mothers ($p < 0.05$ respectively). Their joint contribution to maternal health-seeking behavior was 91.8% (Adjusted R Square = 0.918) while, individually, concern for impact of the disease on the family and influence of what friends and relatives expect one to do to have effect size of 42.9% ($\beta = .429$) respectively, and knowledge of what to do has the effect size of 44.9% ($\beta = .449$) on the mothers' health-seeking behaviour. These findings are buttressed further in findings displayed in table 6.

Only marital status showed significant association with the mothers' health-seeking behavior. On further analysis, divorced mothers have higher health-seeking behaviour followed by the widows/separated then the single mothers and lastly married, mothers. The high health-seeking behaviour of the first three groups of mothers who are without the presence and support of a husband could be because of greater impacts of the factors of concern for impact, influence of what friends and relatives expect one to do and of course because they do not have husbands to depend on. An awareness of their sole responsibility for the care of their child might be a contributing factor. It is natural for them to be dynamic at amassing useful knowledge regarding their family survival and wellbeing. The three predicting factors of health-seeking behaviour would naturally be strong in those groups of women unlike in the married who have the support and protection of their husband which may lessen their concern for impact and influence of what

friends and relatives expect.

The present study shows that mothers had good knowledge, good perception and good health-seeking behaviour towards childhood anaemia. Their knowledge rated lower than their perception and health seeking behaviour. Health education and interventions aimed at improving maternal knowledge of childhood anaemia to lessen the prevalence of the disease in children will be needful. Young mothers should be targeted for health education on childhood anaemia as part of health education during routine immunization. Health education towards recognition of features of anaemia and prevention should be included in the school health program, especially for adolescents, as they would benefit from the knowledge when they become mothers, and also, they can disseminate the knowledge to the community. Findings of this study have important implications for the design and implementation of effective health programs to reduce childhood morbidity and mortality due to anaemia in Nigeria.

Conflict of interest: Nil

REFERENCES

1. World Health Organization {WHO}. Haemoglobin concentration for the diagnosis of anaemia and assessment of severity. Vitamin and Mineral Nutrition Information System. Geneva: World Health Organization; 2011. WHO/NHM/NHD/MNM/11.1. Available from: <http://www.who.int/vmins/indicator/haemoglobin.pdf> (Accessed April 5,2023)
2. Haile W. Yigzaw K, Amare T. Factors associated with anaemia among children aged 6-23 months attending growth monitoring at Tsitsika Health center, Wag-Himra Zone, Northeast Ethiopia. J Nutr Metab. 2015; 2015:928632.
3. Pasricha SR, Drakesmith H. Impact of anaemia on health and development in

- children. *Lancet Child Adolesc Health*. 2020; 4(7):508-517.
4. Waghmare A, Kurian S, Nagaraj N, Alaparthi GK. Clinical profile and outcomes of anemia in hospitalized children. *J Pediatr*. 2019; 209:161-167.
5. Chandwani H, Pandor J. Health-seeking behaviors of mothers regarding their children in a tribal community of Gujarat, India. *Electro Physic*. 2015; 7(1): 990–997.
6. Ferdous F, Dil Farzana F, Ahmed S, Das SK, Malek MA, Das Jui et al. Mothers' perception and healthcare seeking behavior of pneumonia children in rural Bangladesh. *Int Sch Res Notices*. 2014; 690315.
7. Ropo EO, Bayowa TB, Oludare A. Statistical Modeling of Determinants of Anemia Prevalence among Children Aged 6–59 Months in Nigeria: A Cross-Sectional Study. *Anemia*. 2020; (3):4891965.
8. Obiora UJ, Ekpebe PA, Okoye C, David-Idiapho CG. Audit of Childhood Death in a Tertiary Care Center in Niger Delta Region of Nigeria. *West Afr J Med*. 2020; 37(2):113-7.
9. Ekwochi U, Osuorah DIC, Odetunde OI, Egbonu I, Ezechukwu CC. Prevalence of iron deficiency anaemia in anaemic under-5 children in Enugu South East Nigeria. *Nig J Paediatr*. 2014; 41(2):129-32.
10. World Health Organization (WHO). The global prevalence of anemia in 2011. World Health Organization 2015. Available from: <http://apps.who.int/iris/handle/10665/177094>. (Date Accessed: July 15, 2023).
11. Fredanna AD, M'Cormack H, Drolet JC. Assessment of Anemia knowledge, Attitudes and Behaviors Among Pregnant Women in Sierra Leone. *Health Educat*. 2012; 44(2):9–16.
12. Mamta DL, Devi T. Prevalence of anemia and knowledge regarding anemia among reproductive-age women. *IOSR J Nurs Health Sci*. 2014; 3:54–60.
13. Yadav GV, Chakraborty A, Uechi T, Kenmochi N. Ribosomal protein deficiency causes Tp53-independent erythropoiesis failure in zebrafish. *Int J Biochem Cell Biol*. 2014; 49:1–7.
14. Anokye R, Acheampong E., Edusei A, Mprah W, Amoah J, Maame V et al. Perception of childhood anaemia among mothers in Kumasi: a quantitative approach. *Ital J Pediatr*. 2018; 44:142-147.
15. Souganidis ES, Sun K, de Pee S, Kraemer K, Rah J-H, Moench-Pfanner R, et al. Relationship of maternal knowledge of anemia with maternal and child anemia and health-related behaviors targeted at anemia among families in Indonesia. *Matern Child Health J*. 2012; 16(9):1913-1925.
16. Roberts MJ, Hsiao W, Berman P, Reich MR. Getting health reform right: a guide to improving performance and equity. New York: Oxford University Press; 2008.
17. World Health Organization. Background Note: Regional Preparatory Meeting on Promoting Health Literacy [Internet]. UN ECOSOC; 2009 Available from: <http://www.who.int/healthpromotion/conferences/7gchp/track2/en/> (Accessed May 1, 2023)
18. Cochran WG. Sampling Techniques. 3rd ed. New York: John Wiley & Sons; 1977.
19. Moschovis PP, Wiens MO, Arlington L, Antsygina O, Hayden D, Dzik W, et al. Individual, maternal and household risk factors for anaemia among young children in sub-Saharan Africa: a cross-sectional study. *BMJ Open*. 2018; 8(5):e019654.
20. Ojoniyi OO, Odimegwu CO, Olamijuwon EO, Akinyemi JO. Does education offset the effect of maternal disadvantage on childhood anaemia in Tanzania? Evidence from a nationally representative cross-sectional study. *BMC Paediatr*. 2019; 19(1):89.

21. Reindolf A, Enoch A, Anthony KE, Wisdom KM, Justice O, Vida MKA, et al. Perception of childhood anaemia among mothers in Kumasi: a quantitative approach. *Ital J Paediatr*. 2018; 44(1):142.
22. Asresie MB, Fekadu GA, Dagne GW. Determinants of anemia among children aged 6–59 Months in Ethiopia: further analysis of the 2016 Ethiopian Demographic Health Survey. *Adv in Public Health*. 2020; 2020:3634591.
23. Adams C, Costello A, Flynn S. Iron Deficiency Anemia In Ecuador: Does Education Matter; 2009. <https://pdfs.semanticscholar.org/cf26/89806194d67bf893d3615f398dc7e8f096db.pdf> (Accessed May 1, 2023)
24. Adekanmbi VT, Kayode GA, Uthman OA. Individual and contextual factors associated with childhood stunting in Nigeria: a multilevel analysis. *Matern Child Nutr*. 2013; 9(2):244–59.
25. Hazavehei SMM, Jalili Z, Heydarnia AR, Faghihzadeh S. Application of the precede model for controlling iron-deficiency anemia among children aged 1–5, Kerman, Iran. *Promot Educ*. 2006; 13(3):173–7.
26. Nisar N, White F. Factors affecting utilization of antenatal care among reproductive age group women (15–49 years) in an urban squatter settlement of Karachi. *J Pak Med Assoc*. 2008; 53(2):47-53.
27. Turyashemererwa FM, Kikafunda J, Annan R, Tumuhimbise GA. Dietary patterns, anthropometric status, prevalence and risk factors for anaemia among school children aged 5-11 years in Central Uganda. *J Hum Nutr Diet*. 2013; 26:73–81.