



Prevalence of Anaemia among Alabnaa Primary Schools at Tabuk City, Saudi Arabia 2018-2019

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ABSTRACT

Background: Anaemia is one of the most significant health problems among children in the world. Detecting anaemia before the symptoms begin to arise will help in limiting the magnitude of this problem. Anaemia is generally recognized as the greatest nutritional problem among children and adolescents. **Aims of the Study:** This study aims to measure the prevalence, severity, and risk factors of anaemia in primary school children of Alabnaa primary schools, Tabuk city, Saudi Arabia, in the academic year of 2018-2019. **Methods:** The present study is a cross-sectional one, carried out at Alabnaa primary schools at Tabuk city, Saudi Arabia with total coverage of all the students, who were enrolled in the academic year of 2018-2019. The data was collected via a pre-tested questionnaire, designed to meeting study objectives. The total number of the sampled students was 4158, they have undergone, personal interviews and filling out the questionnaire. General examination including observation of the general condition, and pallor, measuring of pulse, weight, and height, chest, heart, and abdominal examination was done to detect any gross abnormality. Then every student was subjected to measuring the blood HB% by Sahle's method. Students having haemoglobin level less than 70% [cut off point] considered anaemic. **Results:** The overall prevalence of anaemia among the studied students was 15.6%. Among the anaemic children, 340 (7.6%) had mild anaemia, 308 (7.4%) had moderate anaemia, and 3 (0.07%) had severe anaemia. There was a significant relationship between haemoglobin level and some socio-demographic characteristics and dietary practices of the studied children. **Conclusion:** This study has revealed that the prevalence of anaemia in children is high and several steps are still needed to increase public awareness about the complications of anaemia, good nutritional habits, iron sources, and prevention of nutritional anaemia.

Key Words: Anaemia, Haemoglobin level, HB%, School children, Sahle's method.

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INTRODUCTION

Anaemia is a condition in which the Red Blood Cells (RBCs) number or their oxygen-carrying capacity is unable to meet physiological demand. [1-3]

Anaemia is defined as a decrease in haemoglobin (Hb), haematocrit, or red blood cells number below the reference range for healthy individuals of similar characteristics such as age, sex, and race. [4] According to the World Health Organization (WHO), for children 5-11 years and 12 - 14 years of age, the threshold Hb level for being anemic is less

than 115 g/l and 120 g/l, respectively. [5]

Anaemia during childhood is associated with negative consequences such as decreasing cognitive development, poor school performance, and affects mental, physical, and social development of the children. [6]

Iron deficiency is considered to be the leading cause of anaemia worldwide. About 1.2 billion people suffer from anaemia related to iron-deficiency. Apart from iron-deficiency other deficiencies can lead to anaemia such as folate and vitamin B12 deficiencies. [7, 8]

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A lot of research has been reported on the prevalence of anaemia worldwide; most of it focused on children under five years old; however, the data related to anaemia from children aged above five years and adolescents are limited. [9]

This study aims to measure the prevalence, severity, and risk factors of anaemia in primary school children of Alabnaa primary schools, Tabuk city, Saudi Arabia, in the academic year of 2018-2019.

PARTICIPANTS AND METHOD:

The present study is a cross-sectional one, carried out at Alabnaa primary schools at Tabuk city, Saudi Arabia by a total coverage of all the students, who were enrolled in the academic year of 2018-2019. The data was collected via a pre-tested questionnaire, designed to meet study objectives. It includes questions about participants age, grade, haemoglobin level, anaemia severity (mild, moderate, and severe). The total number of the sampled students was 4158, they have undergone, personal interviews and filling out the questionnaire. General examination including observation of the general condition, and pallor, measuring of pulse, weight, and height, chest, heart, and abdominal examination was done to detect any gross abnormality. Then every student was subjected to measuring the blood HB% by Sahle's method. Students having haemoglobin level less than 70% [cut off point] considered anaemic.

A Pilot study was conducted on 20 female secondary school students to test the questionnaire's clarity and relevance, the time needed to answer all questions, and test reliability. There were no modifications, and they were included in the analysis.

Ethical Considerations:

The current survey was approved by the ethical committee of the armed forces hospital, North-western region, Saudi Arabia (Ref. Number: KSAFH-REC-2019-277). Also, it was taken from the administration of Tabuk General Directorate of education.

Data Management:

All data were collected, tabulated, and statistically analyzed using SPSS 23.0 for windows (SPSS Inc., Chicago, IL, USA). Quantitative data were expressed as the mean \pm SD and (range), and qualitative data were expressed as absolute frequencies (number) and relative frequencies (percentage).

RESULTS

Table 1 shows the class levels of the studied students, Alabnaa primary schools. The total number of study

participants was 4158. 43.6% were male while 56.3% were female with an average age of 9 years.

Table 2 illustrates the assessment severity of anaemia in the studied students. The overall prevalence of anaemia was 15.6%. Among anemic children, 340 (7.6%) had mild anaemia, 308 (7.4%) had moderate anaemia, and 3 (0.07%) had severe anaemia.

Table 3 illustrates the comparisons of haemoglobin in the studied students. Among male children, the average haemoglobin level was 12.6 g/dl, maximum and minimum haemoglobin concentration was 16.8 g/dl and 7.2 g/dl, respectively. While among female children, the average haemoglobin level was 12.8 g/dl, maximum and minimum haemoglobin concentration was 16.8 g/dl and 5 g/dl, respectively.

Table 1: Class Levels of the Studied Students, Alabnaa Primary Schools, Tabuk City, Saudi Arabia, 2018-2019

Grade	Male	Percentage	Female	Percentage
1	220	12.1%	291	12.4%
2	240	13.2%	363	15.4%
3	310	17%	409	17.14%
4	306	16.8%	433	18.4%
5	328	18%	434	18.5%
6	410	22.6%	414	17.6%
Total	1814	100%	2344	100%

Table 2: Assessment of Severity of Anaemia in the Studied Students, Alabnaa Primary Schools, Tabuk city, Saudi Arabia, 2018-2019

Anaemia severity	Male	Percentage	Female	Percentage
No anaemia	1448	79.8%	2057	87.8%
Mild	176	9.7%	164	7%
Moderate	188	10.3%	120	0.5%
Sever	2	0.1%	1	0.04%
Total	1814	100%	2342	100%

Table 3: Comparisons of Haemoglobin in the Studied students, Alabnaa Primary Schools, Tabuk city, Saudi Arabia, 2018-2019.

	Male	Female
Average Hb level	12.6	12.8
Maximum Hb level	16.8	16.8
Minimum Hb level	7.2	5

DISCUSSION

Anaemia is one of the significant public health problems among children worldwide. Understanding risk factors of

anaemia provides more insight into the nature and types of policies that can be put up to fight anaemia.

The present study is a cross-sectional one, aimed to measure the prevalence, severity, and risk factors of anaemia in primary school children of Alabnaa primary schools, Tabuk city, Saudi Arabia, in the academic year of 2018-2019.

In the current study, the prevalence of anaemia is 15.6%, the present findings are different from Ngesa et al.'s study who aimed to measure the prevalence and risk factors of anaemia among children and concluded that anaemia was prevalent in 28% out of 11,711 children. Age and gender were the major factors associated with the anaemia which are found more in older male children. [10] On the other hand, another study published in China reported that the prevalence of anaemia in Chinese children and adolescents has improved significantly in comparison to 10 years before. It showed that the prevalence of anaemia in Chinese children and adolescents has decreased from 12.6% to 6.6%. [11]

The results of the current study are in agreement with those of the study conducted in Iran, obtained from 8461 children in the 7-12 years old age group, whose results showed that the prevalence of iron deficiency anaemia of children aged 7-12 years, was 15%. [12]

At the national level, a study was conducted in Saudi Arabia in four provinces in children less than 14 years, 5381 children were screened from different areas. The overall prevalence of anaemia in Saudi Arabia was found to be 24.8%. The highest prevalence of anaemia was in eastern province (the most higher at al Qateef area) and the lowest in the central (the most lower at al Qaseem area). [13]

CONCLUSION:

In conclusion, this study has revealed that the prevalence of anaemia in children was high and several steps are still needed to increase public awareness and emphasise on the importance of healthy food and lifestyle as a prevention method against anaemia.

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Conflicts of Interest

The authors declare that they have no competing interests.

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