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# Original Research

## Incidence of iron deficiency anaemia among school going children

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### ABSTRACT:

**Background:** This study was conducted to assess the Incidence of iron deficiency anaemia among school going children. **Material and methods:** This study comprised of 100 school children. This cross-sectional study was undertaken as a component of a project aimed at validating a portable instrument for haemoglobin estimation. When necessary, the questionnaire data were prearranged in a specific format to make it easier to gather and to guarantee precision. The data were inputted into Microsoft Excel 365 and subsequently transferred to SPSS V.20 for Windows, a statistical software program designed for social science analysis. The variable being measured in this study is anaemia, as defined previously. **Results:** There were 50 males and 50 females in this study. The mean age of the children was 14.7 years. It was observed that 89 out of 100 children showed iron deficiency anaemia. **Conclusion:** 89% of the school going children showed Iron deficiency anaemia.

**Keywords:** anaemia, iron deficiency, school children, incidence.

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### INTRODUCTION

Iron deficiency anaemia (IDA) is the most frequent hematological disorder of childhood and adolescence and the most common form of anaemia, with an incidence in industrialized countries of 20.1% between 0 and 4 years of age and 5.9% between 5 and 14 years (39 and 48.1% in developing countries).<sup>1</sup> It is a hypochromic and microcytic anaemia characterized by Hb values below the normal range for sex and age, reduced MCV, and MCH.

Iron is an essential nutrient for the development of the fetus, infant, and child.<sup>2</sup> The body's iron content is dependent on its intake and absorption with nutrition. The homeostasis of this nutrient is determined by the balance between its uptake and release from the cells where it is stored and recycled.<sup>3,4</sup> Iron is released into the circulation, where it is carried by the plasma protein transferrin, into the duodenum by enterocytes that absorb dietary iron, and by macrophages which recycle senescent erythrocytes and liver reserves.<sup>3</sup>

Anaemia has significant adverse health consequences and impacts on social and economic development. Globally, it causes 68.36 and 58.6 million years lived with a disability in 2010<sup>4</sup> and 2019<sup>5</sup> respectively. Anaemia harms the physical, and cognitive

development of affected children and subsequently their educational achievement which may lead to loss of productivity at a later age in life.<sup>6</sup> It also affects the function of immune systems and consequently increases the risk of infections by impacting both humoral and cellular immunity.<sup>7,8</sup>

Hence, this study was conducted to assess the Incidence of iron deficiency anaemia among school going children.

### MATERIAL AND METHODS

This study comprised of 100 school children. This cross-sectional study was undertaken as a component of a project aimed at validating a portable instrument for haemoglobin estimation. When necessary, the questionnaire data were prearranged in a specific format to make it easier to gather and to guarantee precision. The data were inputted into Microsoft Excel 365 and subsequently transferred to SPSS V.20 for Windows, a statistical software program designed for social science analysis. The variable being measured in this study is anaemia, as defined previously.

## RESULTS

**Table 1: Gender-wise distribution of subjects.**

Gender	Number of subjects	Percentage
Males	50	50%
Females	50	50%
Total	100	100%

There were 50 males and 50 females in this study. The mean age of the children was 14.7 years.

**Table 2: Incidence of Iron Deficiency Anaemia.**

Incidence	Number of subjects	Percentage
Present	89	89%
Absent	11	11%
Total	100	100%

89 out of 100 children had iron deficiency anaemia.

## DISCUSSION

Iron deficiency anaemia (IDA) is by far the most common anaemia worldwide. World Health Organization (WHO) estimates that close to two billion people or 25% of the world's population are anemic, and approximately half of them suffer from IDA.<sup>9</sup> Besides, for every patient with IDA, there is at least one more with iron deficiency without anaemia. Therefore, there are more than two billion people with iron deficiency with or without anaemia, and most of them reside in resource-poor countries.<sup>10</sup> Additional causes of anaemia in low-income countries include other nutritional deficiencies (vitamin B12, folic acid, riboflavin), chronic diseases, parasitic infections like malaria, haemoglobinopathies, and lead poisoning.<sup>11</sup> Anaemia is a significant cause of maternal deaths and adverse pregnancy outcomes in developing countries. A recent meta-analysis showed that 42.7% of women in low- and middle-income countries experienced anaemia during pregnancy, and this was associated with significantly higher risks of low birth weight, preterm birth, perinatal and neonatal mortality. South Asian and African countries had the highest pooled anaemia prevalence. Overall, 12% of low birth weight, 19% of preterm births, and 18% of perinatal mortality were attributable to maternal anaemia.<sup>12</sup>

Hence, this study was conducted to assess the Incidence of iron deficiency anaemia among school going children.

A study was conducted by Achouri I et al<sup>13</sup> to estimate the prevalence of anaemia among school children in Kenitra. The sample represented school children of all educational levels and age ranged between 6-15 years. The level of haemoglobin, haematocrit, mean corpuscular volume, mean corpuscular haemoglobin and mean corpuscular haemoglobin concentration was measured in a group of 271 school children. The seric iron was assessed and anaemia was defined when haemoglobin < 11.5 g dL(-1). A questionnaire was developed to obtain information about the daily food consumption and socio-economic conditions. The prevalence of anaemia was 16.2%. The mean haemoglobin concentration was 12.53 g dL(-1) in

boys and 12.52 g dL(-1) in girls. The results suggest that iron deficiency is an important determinant of anaemia in this population. There was a significant relationship between education of the mother and anaemia in children ( $p = 0.004$ ) but not with the family income. It was concluded that improving the economic status of the family, women education and health education about balanced animal and plant food consumption are recommended strategies to reduce the burden of anaemia.

Kundu S et al<sup>14</sup> conducted a systematic review and meta-analysis to determine the prevalence of anaemia among children and adolescents aged between 6 months and 19 years in Bangladesh. Databases such as PubMed, Scopus, and Google Scholar were searched to identify the studies that reported the prevalence of anaemia among children and adolescents. A total of 24 studies, including the data of 14,062 cases, were included in the systematic review and meta-analysis of the time period between 1997 and 2019. The random-effects model was used to calculate the summary estimates. The protocol was registered with PROSPERO (CRD42021246960). The pooled prevalence of anaemia, iron deficiency anaemia (IDA), and non-severe and severe anaemia were 46.8% [95% CI: 36.0–57.6], 13.6% [95% CI: 8.0–19.2], 56.4% [95% CI: 39.6–73.1] and 0.7% [95% CI: 0.1–1.4], respectively. Prevalence of anaemia exhibited the highest among the children aged  $\leq 2$  years.

## CONCLUSION

89% of the school going children showed Iron deficiency anaemia.

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