

EFFECT OF ANAEMIA ON THE ACADEMIC PERFORMANCE OF ADOLESCENT GIRLS

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Abstract

Adolescent girls are vulnerable to anaemia. During this stage, adolescents achieve 15%-20% of their adult height, up to 60% of their skeletal mass, and half their adult body weight. In the case of adolescent girls' regular blood loss that occurs with menstruation increases iron losses and thus iron requirements. Insufficient iron stores may lead to numerous functional consequences such as impaired maximal work capacity; decreased immunological competence; behavioral abnormalities and reduced academic performance. The present study was conducted to assess the academic performance of college going adolescent girls in relation to anaemia. About 600 adolescent girls were selected. An interview schedule was used as a tool to obtain information regarding demographic profile, dietary habits and academic performance. Haemoglobin level was estimated. Student's t-test and Chi-square test were employed. All the participants were within the age group of 17 to 19 years. From the findings, it is evident that half of the adolescent girls (53%) were moderate academic performers. About 14%, 29.6% and 3.4% of adolescent girls were assessed to be high performers, low performers and very low performers respectively. The findings also revealed that there is a significant difference between the anaemic status and academic performance of the adolescent girls. Therefore, it is concluded that majority of the selected anaemic adolescent girls were belonged to moderate and low performance category and only a minimum percent of anaemic adolescent girls were high performers. Early identification and treatment of anaemia is necessary for improving the academic performance among adolescent girls.

Keywords: adolescent girls, anaemia, academic performance

Introduction

Anaemia is a condition in which the number of red blood cells is insufficient to meet the physiological requirements of humans¹. Anaemia affects health, productivity, survival, income, and development. Iron deficiency with or without anaemia impairs cognitive development, shortens memory capacity, and limits attention span, resulting in poor classroom performance, high absenteeism, and dropout rates among school children and adolescents. Iron deficiency has been identified as one of the most important nutritional causes of anaemia in adolescent girls. Iron deficiency can cause up to a 30% impairment of physical work capacity and performance. Numerous studies indicated that the prevalence of anaemia was universal among adolescent girls, and thus anaemia in adolescent girls is now considered to be a public health problem. The leading cause of anaemia during adolescence is the increased nutritional demands for growth and development. World Health Organization (2011) estimated that in South-East Asian Region (SEAR), over 200 million women of reproductive age were anaemic in which 191 million were non-pregnant and 11.5 million were pregnant women. The drastic effects of anaemia, such as poor pregnancy

outcomes, reduced work capacity, and cognitive impairment, affect the health and economic development. Anaemia and iron deficiency anaemia, which could affect the adolescents' productivity and academic performance. The first function affected by iron deficiency anaemia was the brain enzymes related to behaviour and cognition. The impact of iron insufficiency was irreversible in the early stages of life (infancy) and affected the physical, scholarly and educational outcomes in the adolescent stage². Various studies indicated that adequate iron was fundamental for growth and development. Its inadequacy in all the life stages decreased the learning capacity and reduced the power of perception. Therefore, anaemia decreases learning abilities which increased the academic dropout among students³. Studies conducted in Palestine, Saudi Arabia, and India showed that anaemia had a negative effect on academic performance because anaemia was associated with reduced oxygen saturation of the blood supply to the brain, which was believed to cause silent cerebral infarction and resulted in mental impairment of adolescent school girls⁴. Research conducted in eight Asian and African countries showed that showed that the students' academic failure, decreased mental concentration, and reduced learning ability of the anaemic

students were more than the rest of their peers. This survey has also shown that with providing food supplements, notable improvement has been noticed in students' academic performance⁵. Therefore, the present study was undertaken to assess the effect of anaemia on the academic performance of adolescent girls.

Methodology

The present study was a cross-sectional study carried out at a Women's College in Madurai, with 621 adolescent girls aged between 17 and 19 years. Purposive sampling technique was used to select the subjects. The subjects were grouped into anaemic and non anaemic groups and further the anaemic group was grouped into mild, moderate and severe anaemic as per WHO guidelines. Screening for anaemia was carried out for all the adolescent girls through cyanmethaemoglobin method. For identifying the prevalence of anemia, haemoglobin level < 12g/dl was taken as cut-off point. The severity of anemia was graded as Mild (10-12gm/ dl), Moderate (7-10gm/dl) and Severe (<7gm/dl).

Academic achievement is usually measured by examinations or continuous assessment of the students. Several investigators have used examination marks as an indicator of achievement. In the present research percentage of marks obtained in examinations was used as the indicator of academic achievement. Academic performance of the adolescent girls was assessed by the percentage of marks scored by the adolescent girls in their examination. According to the percentage of marks scored by the adolescent girls, they were categorized into four groups as follows:

Table 1: Grouping of Adolescent Girls According to their Academic Performance

Groups	Percentage of Marks
High Performers	Above 80%
Moderate Performers	60-80%
Low Performers	40-60%
Very low Performers	less than 40%

Results and Discussion

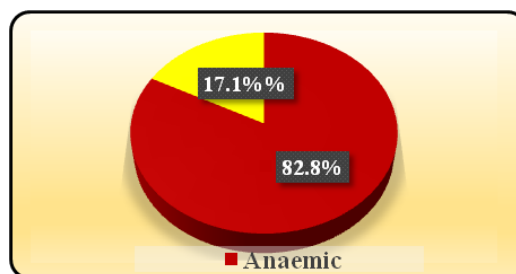
Table 1 depicts the distribution of adolescent girls according to their age. Most of the adolescent girls selected for the study belonged to 17 years of age (49.5%), followed by 18 years (43.5%), and 7 per cent of the girls belonged to 19 years.

Table 1: Distribution of Adolescent Girls According to their Age

Age (in years)	Study Participants (n=600)	
	Number	Percentage
17	297	49.5
18	261	43.5
19	42	7.0

Anaemia, described as a low blood haemoglobin concentration, is a public health problem that affects low-, middle- and high-income countries and has significant adverse health consequences and impacts on social and economic development⁶. Anaemia is considered severe, moderate, mild, and no public health problem if its prevalence is ≥ 40 per cent, 20-39.9 per cent, 5-19.9 per cent, and <5 per cent respectively in the community (WHO, 2015). The following Figure 1 represents the prevalence of anaemia among adolescent girls.

Figure 1: Prevalence of Anaemia among Adolescent Girls



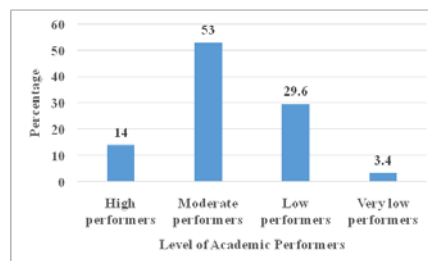
By the WHO criteria for diagnosing anaemia, out of 600 adolescent girls, 497 girls (82.8%) were anaemic, and only 103 girls (17.1%) were normal. The results showed that anaemia's overall prevalence was 82.8 per cent, indicating a severe public health problem. A similar prevalence of anaemia (69.2%) was reported by Srivastava et al., (2016). Also, in a multi-country study on adolescents' nutritional status, carried out by the International Centre for Research on Women, indicated that anaemia was the most widespread nutritional problem. Its prevalence ranges from 32-55 per cent⁷. The study conducted among college-going adolescent girls in rural northern India reported that the prevalence of anaemia was 43.76 per cent. A continually high level of anaemia among women in India (53% of all women have anaemia as per the National Family Health Survey 2015–2016) is of great concern, and the 2017 National Health Policy given by the Ministry of Health and Family Welfare, Government of India, acknowledges this high burden. Considering this as an

alarming situation, on 1 December 2017, the Union Cabinet approved the setting up of the National Nutrition Mission under the oversight of the Ministry of Women and Child Development. Among many targets, the National Nutrition Mission aims to decrease the prevalence of anaemia among young children and women of reproductive age (15–49 years) by one-third of NFHS 4 levels by 2022.

Academic Performance of Adolescent Girls

Anaemia during adolescence leads to numerous functional consequences such as impaired maximal work capacity; decreased immunological competence; behavioral abnormalities and reduced academic performance. The academic performance of the adolescent girls was given in Figure 2.

Figure 2: Academic Performance of Adolescent Girls



The above Figure 2 indicated half of the adolescent girls (53%) were moderate academic performers. About 14%, 29.6% and 3.4% of adolescent girls were assessed to be high performers, low performers and very low performers respectively.

Association of Academic Performance with Anaemia

The present study assessed the academic performance of college going adolescent girls in relation to anaemia and the findings were presented in Table 2.

Table 2: Association of Academic Performance with Anaemia

Academic Performance	Mild anaemia	Moderate anaemia	Severe anaemia	Normal	Total		Chi square (df)	P value
High performers (above 80%)	25	7	-	55	82	14	423.421	P<.000 Significant
Moderate performers (60-80%)	151	135	3	40	324	54		
Low performers (40-60%)	18	148	9	9	179	30		

Data obtained from the present experiment revealed that there is a significant difference between the anaemic status and academic performance of the adolescent girls. In addition, majority of the selected anaemic adolescent girls (329) were belonged to moderate and low performance category (184) and only a low percent of anaemic adolescent girls (21) were high performers. The findings also showed that a maximum of mild anaemic adolescent girls (151) were moderate performers; around 148 moderate anaemic adolescent girls were low performers; about 12 severely anaemic adolescent girls were very low performers. Early identification and treatment of anaemia is essential for improving the academic performance among adolescent girls. These findings are in par with the investigation done by Soleimani and Abbaszadeh (2011). Therefore, the present study proves that anaemia is a significant physiological problem

that negatively affects learning and educational achievement.

Conclusion

Anaemia is a preventable cause of cognitive impairment and other negative effects on the academic potential of adolescent girls. Iron is needed continuously for brain growth. The developmental deficits related to anaemia can to some extent be corrected with iron treatment; however, there is evidence that some deficits are not reversible with iron treatment. The purpose of the study was to explore the effects of anaemia on academic performance of adolescent girls. The findings of the present study is consistent with literature as most of the previous studies found that anaemia negatively affects academic performance. Therefore, the study proves that anaemia is associated with poor academic performance.

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