

## Original Research Article

# Symptoms-Based Evaluation of Iron Deficiency Anemia in Students of Bahawalpur Correlated with their Eating Habits

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### Abstract

**Purpose:** To conduct a symptoms-based evaluation of iron deficiency anemia (IDA) in university and colleges students of Bahawalpur- Pakistan and correlate the data with their eating habits.

**Methods:** A cross-sectional survey was accomplished using a questionnaire for the assessment of IDA among 500 students enrolled in the Islamia University of Bahawalpur and two affiliated colleges in Bahawalpur, Pakistan. Symptoms-based evaluation was carried out to obtain the results.

**Results:** The results showed that 41.2 % (206 students) of the 500 students were anemic. The proportion of anemic females and males was 65.53 % (135) and 34.46 % (71), respectively. Of the 206 students, 96.11 % (198) were below the age of 25 years, 83.96 % (173) in official hostels, 52.42 % (108) belonged to families of average socioeconomic status, 77.18 % (159) suffer from short-term memory, and 47.08 % (97) were unaware of IDA. The most commonly observed symptoms were flattened brittle nails, dizziness, and fatigue after physical activity, 88.83 % (183); presence or absence of glossitis 87.37% (180); ringing in the ears, 84.46 % (174); headache, 62.62 % (129); frequent minor infections, 46.60 % (96); shortness of breath, 40.29 % (83); taste disturbance, 35.92 % (74); ice cravings, 22.33 % (46); and angular stomatitis 18.97 % (39).

**Conclusion:** An unexpectedly large number of female students exhibit symptoms of IDA due to poor nourishment. Findings from this survey can be used in awareness programs to increase academic performance in young adults and to eliminate IDA.

**Keywords:** Iron deficiency Anemia, Students, Eating habits, Awareness programs

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## INTRODUCTION

Iron is a crucial micronutrient required for oxygen transport, oxidative metabolism, cellular proliferation and physiological processes [1]. Iron absorption is up-regulated by iron deficiency and increased erythropoiesis. It is down regulated in inflammation resulting iron depletion. It is mediated by the regulator of iron homeostasis that blocks iron release from enterocytes and macrophages which results in anemia [2].

The World Health Organization (WHO) defines anemia as hemoglobin level below 130 g/L in men, 120 g/L in women and 110 g/L in pregnant women [3,4]. Iron deficiency can delay normal infant motor function during pregnancy, increase the risk for small or early (pre-term) babies, cause fatigue in adults and affect memory or other mental functions in teens [5]. *Helicobacter pylori* colonization is also bracketed with IDA which may spoil iron uptake/intensify iron loss

[6]. Pregnancy fallouts in an overall surplus iron constraint is about 1000 mg [7]. IDA is one of the extensive causes of poor academic performance and low level of health status of students [9]. The common signs of developing anemia are chronic fatigue, loss of appetite, headaches, irritability and loss of concentration. IDA causes minor health dilemmas that may lead to complicated diseases. Students in educational institutes should be made aware of this health issue so that they can take steps to improve both curricular and extracurricular performances. IDA is associated with impaired cognitive development in pre-school-aged children and diminished work productivity in adults [8].

The purpose of this study was to conduct a symptoms-based evaluation of IDA in university and college students of Bahawalpur- Pakistan and correlate the data with their eating habits.

## METHODS

Evidence-based study was accomplished to evaluate awareness about the prevalence of different IDA symptoms in the students in Bahawalpur, Pakistan. To accomplish the study, a questionnaire was designed. Questionnaires were circulated by a five-membered team of students to 500 students in the Islamia University of Bahawalpur, affiliated colleges (SE college and Degree College Bahawalpur) and various hostels of the city. Students belonging to different regions, different age groups, different races and different socio-economic status filled questionnaires.

The filled questionnaires contained the demographic data of the students and 14 major symptoms of IDA commonly found and observed in anemic patients. The questionnaire also contained a table containing the routine nutritional habits of the students. Non-specific data of 500 students was collected and evaluated for presence of symptoms and their eating habits to find out the prevalence of anemia that they mentioned in questionnaires. The students showing symptoms of anemia according to set criteria were separated [9]. The most common signs of anemia were taken to be chronic fatigue, loss of appetite, headaches, irritability, loss of concentration, brittle nails, angular stomatitis, ice cravings, paleness of skin and eyes, shortness of breath, headache and taste disturbance etc. Those students who showed 5 or more IDA symptoms were considered anemic [10].

## Statistical analysis

Statistical Package for Social Sciences 17.0 software was used to analyze the data in mean and percentage by using computer to find out symptoms-based evaluation of IDA in these students.

## RESULTS

Of the 500 students, 41.2% (206) were anemic while 58.8% (294) were non-anemic. Furthermore, out of 206 that were anemic, the proportion of anemic females was greater than that of males (Table 1). A large number of students (96.11%) were below the age of 25 years.

**Table 1:** Age and sex wise distribution of anemic students (n = 206)

Age	> 25 years	3.88 % (8)
	< 25 years	96.11 % (198)
Sex	Male	34.46 % (71)
	Female	65.53 % (135)

As the study was based on the evaluation of students, who are usually of two categories; either hostel boarders or those who reside in their homes. Out of 206 anemic students, the results obtained were given in Table 2 in comprehensive manner.

## DISCUSSION

IDA is a nutritional disorder in our community specifically in women and young [11]. In this study, 65.53% (135) of students were females and most of the cases were the age group below 25 years. IDA was found to be more common among females than males. That is due to the probability of iron deficiency that upsurges at puberty, menstruation and iron constraints [12]. A hefty number of students narrated that they were having few health problems that were outstandingly associated to IDA. Unfortunately, many of them were not aware that they suffered. Boarder students were found to be more anemic than non-boarder. They do not annex adequate diet, yet work hard as laborers and as a result fosters a number of nutritional flaws as well as iron deficiency. Inferior hygiene brews them susceptible to parasitic infestations, particularly hookworm infection [13]. The 3<sup>rd</sup> National Health and Nutrition Examination Survey conducted during 1988 to 1994 in USA which exposed that the occurrence of iron deficiency is higher among children living at or below the poverty level than those living above the poverty level [14]. As most of the students were boarder and belonged to

**Table 2:** Evaluation of social profile of 206 anemic students

Social profile	Aspect	% (N)
Residence	Hostel resident	83.98% (173)
	Non-hostel resident	16.01% (33)
Socioeconomic status	Rich	36.89% (76)
	Average	52.42% (108)
	Poor	10.67% (22)
Academic status	Average	65.53% (135)
	Above Average	34.46% (71)
Memory status	Long- term	22.81% (47)
	Short- term	77.18% (159)
Self-analysis	Aware	52.91% (109)
	Unaware	47.08% (97)
Eating habits (per day)	Take Grains	77.66% (160)
	Fruit	13.10% (27)
	Milk	48.54% (100)
	Vegetables	55.82% (115)
	Meat	43.68% (90)
Symptoms variations	Dizziness and fatigue after physical activity	88.83% (183)
	Pale nails	19.41% (40)
	Frequent minor infections	46.60% (96)
	Shortness of breath	40.29% (83)
	Taste disturbance	35.92% (74)
	Headache	62.62% (129)
	Ice craving	22.33% (46)
	Flattened brittle nails	88.83% (183)
	Angular stomatitis	18.933% (39)
	Glosittis	87.37% (180)
	Ringling in the ears	84.46% (174)

average family so their nutritional inadequacy was found to be the second most general cause of IDA. These patients did not have any associated disease. The students taking milk, meat, grains and cereals were having comparatively low iron deficiency. Common symptoms were the headaches, dizziness, glosittis, fatigue after physical activity, frequent minor infections brittle nails and ice cravings. Short- term memory status was the problem of 77.18% (159) of students but academic performance was not that much affected according to their opinion. Poor socio-economic status was the salient problem behind IDA in majority of cases. The students enjoying the status of boarder were having more % age of anemia than those living in their homes. Food habits were having clear evidences on anemia.

Among copious dynamics of anemia, nutritional aspects like vitamins and iron contribute to the onset of anemia, foremost to iron deficiency. IDA is frequently cured by taking iron rich diet & iron supplements regularly. But it is still common and undercover disease prevailing in our community. The incidence and prevalence of IDA can also be reduced by iron fortification of various foodstuffs under the supervision of health department of government [15].

### Limitations of the study

The study was cross-sectional and therefore, the directionality of the associations could not be determined.

### CONCLUSION

Female students living in boarding accommodation shower more symptoms of IDA due to inadequate nourishment as they particularly experienced dizziness and fatigue after physical activity, thus affecting their work performance considerably. Awareness programs should be conducted to promote awareness and improve performance in young adults and eliminate IDA.

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