

# FACTORS DETERMINING THE SUSCEPTIBILITY OF ANEMIA

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## Abstract:

Anemia is a global disease caused due to lowering of Red Blood Cells (RBCs) and hemoglobin (Hb) level in the blood from a standard normal level, ultimately it affects the casual blood capacity to carry oxygen with it, needed in different parts of the body. There are diverse types of Anemia. The present study is mainly focused on patients having Anemia in general regardless of a specific type. The aim of this research based study is to evaluate the prevalence and incidence of anemia in Pakistani populations. This research based study provided absolute figures, to analyze different aspects kept as questions and problems and sheds light on the key factors involved in the prevalence of anemia.

**Keywords:** Anemia, prevalence, risks, prevention, diagnosis

## Introduction

Anemia is a global disease caused due to lowering of Red Blood Cells (RBCs) and hemoglobin (Hb) level in the blood from a standard normal level, ultimately it affects the casual blood capacity to carry oxygen with it, needed in different parts of the body (Savera and Ali, 2020; Soundarya and Suganthi, 2017)). Approximately 2 billion of the world population is affected by this health issue (Camaschella, 2017), where maximum age group affected by Anemia comes under 5 years old children as 47% and 42% of the pregnant women get affected (Wood et al., 2020). In developing countries the overall Anemia prevalence is found to be as 50 to 80%, out of which 10 to 20% of them suffer from severe conditions of it (Kassebaum et al., 2014).

There are diverse types of Anemia which include Aplastic Anemia (AA) regarded as RBC production defect, comparatively found more in Asians than Americans (Ahmed et al., 2020), Megaloblastic Anemia related to poor maturation of RBCs (Hazir and Bhattacharya, 2020), Iron Deficiency Anemia with defected hemoglobin synthesis (Wolf et al. 2020), Thalassemia a genetic hemoglobin production issue (Cil et al. 2020) and Hemolytic Anemia that is loss of RBCs (Jamwal et al. 2020).

The present study is mainly focused on patients having Anemia in general regardless of a specific type. However a basic information about these types is kept in mind. In Aplastic Anemia the bone marrow does not produce required quantity of RBCs, and health complications include enlargement of normal heart, stress and emotional disturbance, pollutants etc. (Scheinberg & Young, 2012) the causes of AA may include toxic effects of environmental pollutants and specific medication which result in health indicators like headache, chest pain, breathlessness, pale skin. This disease type can be cured by blood transfusions (Shin and Lee, 2013). Megaloblastic Anemic condition is mostly found as shared with Iron Deficiency Anemia. Pernicious Anemia is caused due the core deficiency of Vitamin B12 (Turner & Talbot, 2013). The Hemolytic Anemia includes Sickle Cell Anemia and Thalassemia with pyruvate kinase deficiency (Natasha & Yasmin, 2010).

The after effects of Anemia on infants are diverse some of which are described here people have severe mood swings, feel fatigue, heart failure, inhaling air problem(Soundarya & Suganthi, 2017), Jaundice due to breakdown of RBCs in Hemolytic Anemia (Einollahi and Izadianmehr 2014).

Many treatments have been practised to cure Anemia such as pathophysiology, diagnosis and management (AlQahtanv., 2020) Ferriccarboxymaltose as oral Iron treatment (Bayrak and Cadirci, 2020).

**Objectives**

- The aim of this research based study is to evaluate the prevalence and incidence of anemia in Pakistani populations.
- The research was conducted to understand the ratio of anemia within the families (hereditary aspect)
- To know which anemia type is more common in Pakistan either aplastic anemia or megaloblastic anemia.

**Method**

The experimental work and the results data collection was done at the Services Hospital, Lahore, Pakistan, with the effective permissions of the on duty senior medical superintendent. The sampling for blood tests was done in the premises of outdoor ward of the hospital, where 99 random samples were collected from both genders i.e. males and females.

The data was collected for three consecutive months as February, March and April on weekly basis (twice per week). The volunteers providing blood samples were 62 females and 32 males, where different aspects like age groups and gender ratios were kept in mind and deeply analyzed by comparing them on SPSS 21 software. A pre-prepared questionnaire was used as tool for data collection, which was compiled in terms of percentages and frequencies.

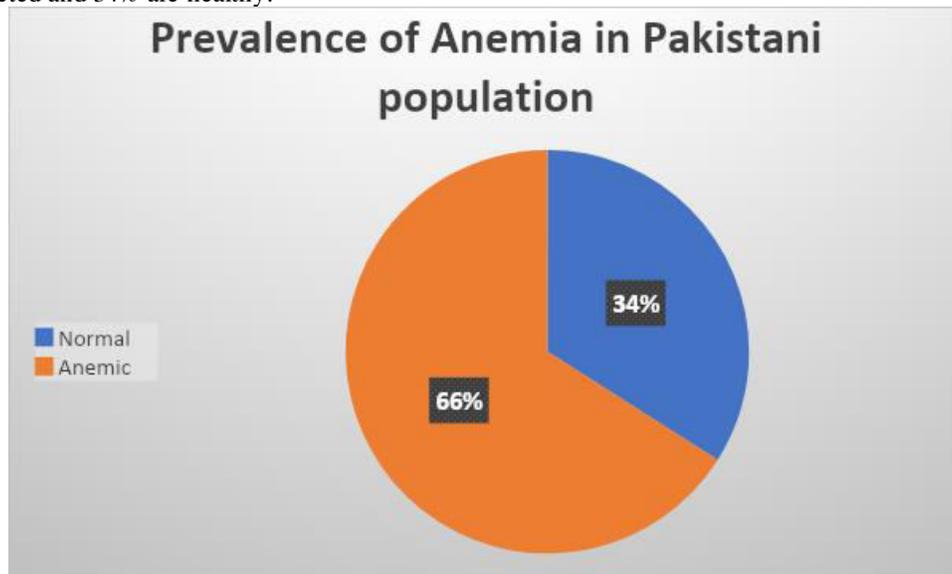
The purpose of data collection and analyzing it statistically (SPSS 21) is to summarize the prevalence of Anemia in population of Pakistan, its distribution among people and major causes.

**Results**

This research based study provided absolute figures, to analyze different aspects kept as questions and problems. Each of the parameter is discussed and supported by representing it in graphical form.

**Prevalence of Anemia in Pakistani population overall**

The results were analyzed in terms of their percentage, which represents that about 60% of Pakistani people are Anemia affected and 34% are healthy.



**Figure 1**The pie chart represents the disease affected and normal Pakistan population in terms of percentage  
**The Anemia prevalence in terms of gender susceptibility**

From the affected population, 70% of the patients were found to be females, whereas 30% of them were males. This proves that women are comparatively prone towards this health issue.

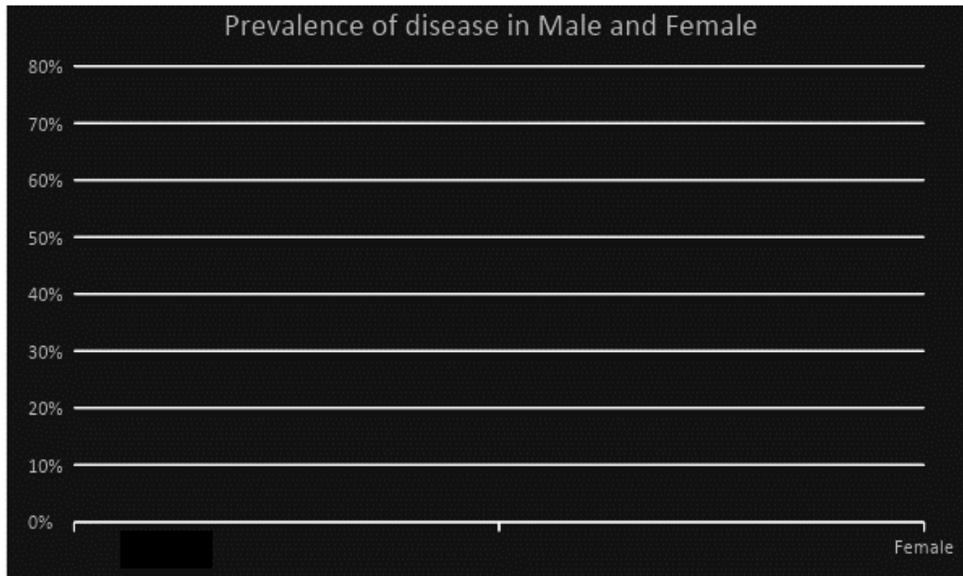


Figure 2

**Estimation of Hemoglobin (Hb) level in Anemic patients**

The Hb level was tested and marked to be extremely low in 57% females and 20% of the males, respectively. The comparison of HB level was compared to standard values as 13.5 to 15 g/dL considered normal for females and 15.5 to 17.5 g/dL for males.

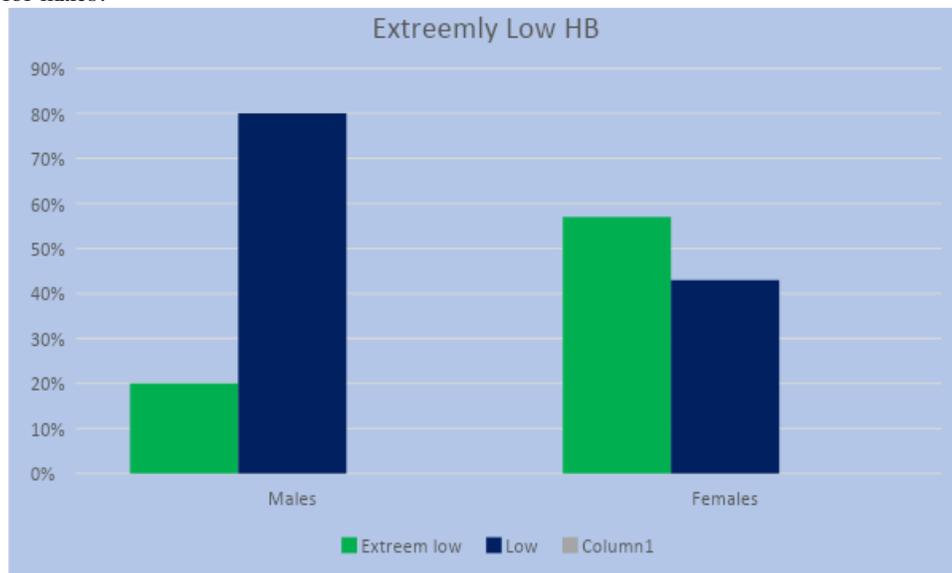


Figure 3 Graphical representation of lowered Hb levels in Anemic males and females

**Variable factors as root cause of Anemia**

While having an overlook some factors were found to be the major causes for developing Anemia in people, which include malnutrition due to shortage of food, unclean water and polluted environment, lack of financial resources to maintain good health, unawareness of the problem existence. All of these are discussed one by one.

**Poor Food supply and environmental conditions**

Studies revealed that 63% of the people had no enough food to eat, 70% had no clean water to drink and 57% people had not cleaned environment to breath in.

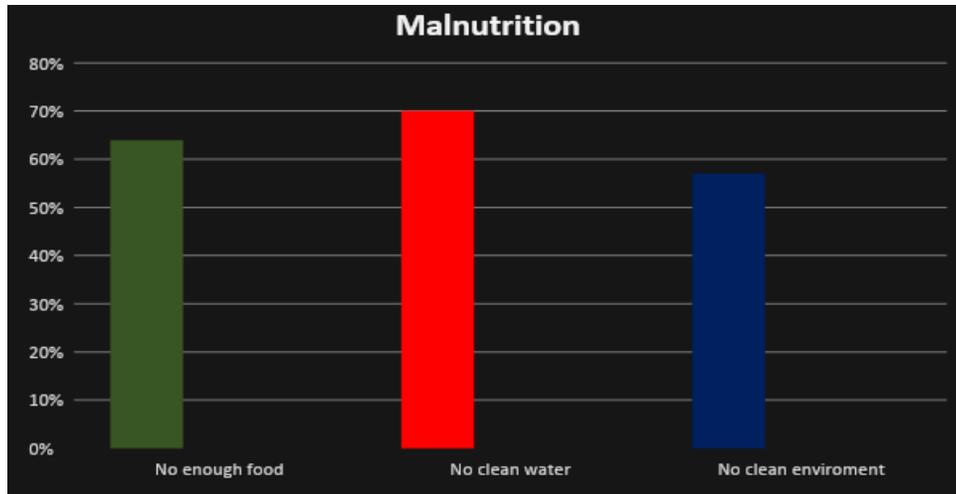


Figure 4 The graph showing percentage of Pakistani population affected by unprovided basic needs of the citizens **Living below poverty line**

Almost 41% people were living a financially unsupported life.

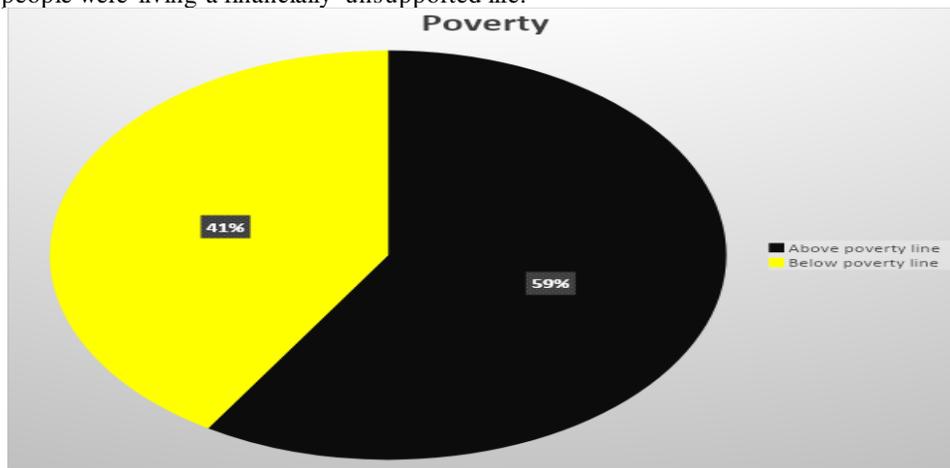


Figure 5 A comparison of people above and below poverty line in Pakistan

**The social and health unawareness**

44% of the population didn't even know what Anemia is and how it is affecting their health.

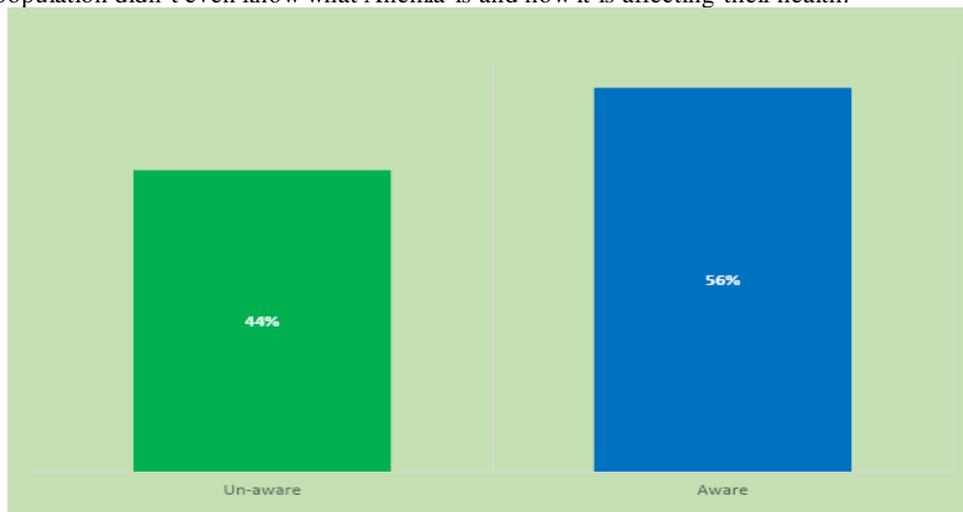


Figure 6 A comparison in terms of percentage showing the awareness and unawareness of Anemia among Pakistani people

All of these problems exist deeply in Pakistan, and is serving as a dilemma towards Anemia as a spreading problem. And this data collected during studies will ultimately help the government and health care department to locate and uproot the root causes.

### Discussion

Anemia is an Iron deficiency disease found worldwide, but most commonly it is affecting the underdeveloped countries population especially the underprivileged women and children, where Pakistan and India are no exceptions (Miller., 2013) almost 66% of the population in Pakistan has malnutrition which leads them to suffer from different diseases including Anemia, in malnutrition the nutrition in body falls to an extremely low level that ultimately causes Anemic symptoms.

1.6 billion of the world population is affected by Anemia (McLean et al. 2009) In Pakistan particularly one of the provinces Sindh, many maternal and fetal deaths have been reported caused due to Anemia and low Hb levels in maternal body (Javed et al., 2020) whereas the results of our research go side by side highlighting that 70% of Anemia affected patients were found to be females and rest 30% were males. So females are more susceptible towards the disease and suffer from it. The most number of affected women are found in Asia as well as Africa, belonging to reproductive age group (Savera and Ali., 2020). On the other hand the hemoglobin level is low when the Hb value lies as <12 g/dL in females and < 14 g/dL in males (Kaisman-Elbaz et al., 2020) and in the present studies 57% females and 20% males were found in the extremely low levels of Hb.

Many different socio-economic factors were analyzed in this study which include malnutrition, poor food availability, contaminated water, poverty and unawareness which could be possible causes of Anemia. Ahmed and his coworkers carried out some experiments keeping clean and unclean water as several parameters on Anemia patients and found out that the water must be contaminated with chemicals or other infectious agents, whereas the sewage contamination had no effect over patients (Ahmed et al., 2020) in the present study 70% and 63% people were found to have no clean water and lacking of food respectively. Also 57% were remaining in poor air quality to breath in. Socha et al., 2020 realized that due to lack of folate and vitamin B12 in diet severe form of megaloblastic anemia was caused. To analyze reason of malnutrition and why people have no enough food to eat and clean water to drink, data was analyzed. Results showed that over 40% of the people were living below the poverty line which means that poverty can be an effective factor behind this deadly disease, this could be proved by a 10 years survey on children of Latin America having Anemia, where kids from different social status, schooling, areas were kept under observation, and the studies revealed the food insecurity is linked with poverty and malnutrition with induced changes in eating habits, and these problems not only exist between different countries but also within the same country due to social and economic discrimination (Shimabuku et al., 2020). Further the data was analyzed to check that how many people are aware of this disease. Studies revealed that just 56% people of the 99 patients knew what they were fighting with Anemia while rest of the 44% didn't had any idea what anemia actually is. In a recent survey to Azad Jammu and Kashmir, Pakistan involved several adolescent girls which were Anemia affected and open to talk about it, where the root causes appeared to be non-communication between parents and children, the cultural shyness in females makes them quiet about their physical health issues, and many of the girls even didn't know about causes like disturbed menstrual cycle, intake of regular proper diet and adequate exercise can have an impact on their lives (Habib et al., 2020).

### Conclusion and future prospects

Malnutrition, poverty and overpopulation are interlinked problems responsible for increased Anemia patients all over the world as well as in underdeveloped regions like Pakistan and India, similarly, lower literacy rate leads to unawareness of such issues in the society. Due to present situation of pandemic Covid-19 worldwide there are high chances of facing such challenges in the near future even more.

So to address such agendas related to health, there is a need to make Pakistan strong economically, and in the education, research sector as well, the purpose is an elevated standard of lifestyle for a common man.

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