Summer Training Report

By
Sanaa Bhadwal

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SANAA BHADWAL

CONTENTS

ABBREVIATIONS

- AMB Anaemia Mukt Bharat
- ANM Auxiliary nurse midwife
- ASHA Accredited social health activist
- BMI Body mass index
- CNNS Comprehensive National Nutrition Survey
- FOGSI Federation of Obstetric and Gynaecological Societies of India
- ICDS Integrated child development scheme
- IFA Iron and folic acid
- IYCF Infant and young child feeding
- MoH&FW Ministry of Health and Family Welfare
- MWCD Ministry of Women & Child Development.
- NFHS National family health survey
- NIPI National Iron Plus Initiative
- NNAPP National nutritional anaemia prophylaxis program
- POSHAN Prime Minister's overarching scheme for Holistic Nourishment Abhiyaan.
- UNICEF United Nations Children's Fund
- WHO World health organisation
- WIFS Weekly Iron Folic Acid Supplementation
- WRA Women in reproductive age group

PART I

LITERATURE REVIEW

NUTRITIONAL ANAEMIA IN INDIAN POPULATION AND STRATEGIES FOR ITS CONTROL- A REVIEW

Sanaa Bhadwal*

Abstract

Anaemia, more precisely iron deficiency anaemia is one of the most common nutritional deficiency across countries. It continues to be a major public health problem plaquing both the developing as well as developed countries. Considerable work needs to be done in this regard to reduce the prevalence of anaemia and promote the health of the global community.To combat anemia an evidence-based approach will prove to be the best way forward, keeping in mind the multifactorial nature of anemia and its increased prevalence in India. This could be done by increasing the availability, affordability and accessibility of good and balanced nutrition to all the sectors of the society. Simultaneously holistic approach to control anaemia by emphasizing on creation of a robust monitoring and review system can prove to be beneficial.

Keywords-*Anaemia, Anaemia mukt Bharat, control strategies*

Introduction

India has one of the largest population of anaemic women in the world and anaemia is therefore a major public health issue in India which is associated with maternal morbidity and mortality and subsequent infant mortality (Ramachandran and Kalaivani, 2018).The two groups at the highest risk of anaemia in India are children and pregnant and lactating mothers.

The most recent program targeting the increasing prevalence of anaemia is Anaemia Mukt Bharat (AMB) program, launched by The Ministry of Health and Family Welfare under the POSHAN Abhiyaan. Its main target is to reduce anaemia by 3% per year thereby attaining the goal of malnutrition free India by 2022. The program implements the 6x6x6 strategy i.e. six age groups, six interventions, six institutional mechanisms.

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*Student MBA-Hospital & Health Management

This program has been built upon the existing framework of National Iron Plus Initiative (NIPI)and places special focus on the health and nutrition needs of children, adolescents, women of reproductive age group, pregnant mothers and lactating mothers.

AMB is designed as an intensified iron plus initiative, however, this is not the first program developed to address the rising burden of anaemia in India. Several other programs and initiatives at national and state levels have been developed in the past years aimed at eliminating the prevalence of anaemia in the country and transforming India into a truly anaemia free nation.

Objectives

1. To understand the current status of anaemia in the Indian population.
2. To study the strategies undertaken to combat anaemia.
3. To understand the functioning of Anaemia mukt bharat campaign.
4. To recognise current challenges and give suitable suggestions.

Methodology

Data and relevant literature were collected from scientific journals, health and nutrition survey reports, and public health dashboards related to anaemia available through online and offline databases. A descriptive review was done to form a clear understanding of the landscape of anaemia in the country and the strategies to combat it.

Background

Anaemia is a condition in which the number of red blood cells or the haemoglobin concentration within them is lower than normal. Haemoglobin is needed to carry oxygen and too few or abnormal red blood cells, or not enough haemoglobin, results in the decreased capacity of the blood to carry oxygen to the body's tissues. This ultimately results in symptoms such as fatigue, weakness, dizziness and shortness of breath, among others (World Health Organization, 2011).

Table 1 shows the levels of haemoglobin for the measurement of anaemia and its severity. Suggested by WHO these cut-offs have remined unchanged since 1968, baring few

exceptions. The table highlights the haemoglobin values in grams per litre for mild, moderate and severe anaemia at sea level.

Table:1 Haemoglobin levels to diagnose anaemia at sea level (g/l) ±

Population	Non-Anaemia	Anaemia		
		Mild	Moderate	Severe
Children 6 - 59 months of age	110 or higher	100-109	70-99	Lower than 70
Children 5 - 11 years of age	115 or higher	110-114	80-109	Lower than 80
Children 12 - 14 years of age	120 or higher	110-119	80-109	Lower than 80
Non-pregnant women (15 years of age and above)	120 or higher	110-119	80-109	Lower than 80
Pregnant women	110 or higher	100-109	70-99	Lower than 70
Men (15 years of age and above)	130 or higher	110-129	80-109	Lower than 80

Source: Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity, WHO

Anaemia can be caused by iron deficiency, nutritional deficiencies such as folate, vitamin B12 and vitamin A deficiencies, acute and chronic inflammation, parasitic infections, and inherited or acquired disorders.

The contributing factors for undernutrition/ malnutrition which inherently cause anaemia are household food security, lack of properly balanced diet, insufficient knowledge of healthy eating habits (Ray, 2011).Malnourished women carry on the generational cycle of anaemia by giving birth to babies with low birth weight and poor growth indicators.

The manifestations of anaemia vary according to the range of severity of the disease. It is a common but mostly preventable cause of maternal and infant mortality. In pregnancy anaemia can be associated with cases of post -partum haemorrhage, low weight at birth, premature or still birth.

Status of anaemia in India

Evidences from several studies both at national and state level help paint the current and past picture of anaemia in the country and help understand the approaches that need to be applied to end this growing burden of anaemia.

One of the earliest studies on the prevalence of anaemia in the adult rural population of north India (Malhotra *et al.*, 2004) suggests that the problem of anaemia persists in groups other than the ones traditionally considered to be at high risk for anaemia i.e. children and pregnant females. This study also throws light on the high prevalence of anaemia in the low socioeconomic groups and illiterate individuals with low body mass index (BMI).

In a study to check the prevalence of anaemia in pregnant and lactating, nonpregnant and nonlactating Indian women (Siddiqui *et al.*, 2017), it was seen that those who received program benefits had higher prevalence of anaemia as compared to others. The results showed that that older pregnant women (aged >35 years) showed a higher prevalence of moderate and severe anaemia than younger women. Lactating women between the age group 15-24 yrs showed higher burden of mild (48%) and moderate (21%) anaemia.

A cross-sectional study to analyse anaemia and its determinants in the rural population of south India (Little *et al*., 2018) discovered that the prevalence of anaemia in women was consistent with the national rural average of 57.4% but was lower as compared to other regions in Tamil Nadu. The study showed that the mean blood Hb concentration was lower in women than in men. Older age groups were associated with lower Hb levels and increased incidence of anaemia especially men.

Socio-demographic factors such as maternal age and maternal education, as well as wealth index, show a correlation with the incidence of anaemia in childhood. According to the study conducted 52.9% of children in the rich households were anaemic, and 63.2% of children in the poor household were found to be anaemic (Onyeneho *et al*., 2019).

A study was done to access the prevalence of anaemia among AMB beneficiaries in Uttarakhand (Singh *et al*., 2020), out of the total beneficiaries found to be anaemic,45.1% were males and 54.9% were females. Females were found to be more anaemic and showed higher prevalence of moderate and severe anaemia. In the age group of 15-49 yrs the

anaemic males and females were found to be higher when compared with NFHS 4 data for Uttarakhand.

In the study of prevalence of anaemia in primary school children (Gandhi and Panchal, 2020), it was found that moderate anaemia was very high in girls when compared to boys in all the age groups.

The report of the Comprehensive National Nutrition Survey (CNNS) that analysed haemoglobin and ferritin in the age group of 1-19 yrs suggested that that the highest prevalence of anaemia is seen in children less than 5 years of age and above 11 years of age (Nair *et al*., 2020).

Table 2 highlights the prevalence of anaemia in India as per the NFHS 4 data. According to NFHS-4 almost 50 per cent of pregnant women in India are anaemic, whereas 53% of the women in reproductive age group (WRA) were found to be anaemic. Lowest prevalence of anaemia was seen in the adolescent boys aged 15- 19 yrs. at 29%.

Table 2 Anaemia prevalence (%)

Age group	**2016 (NFHS-4)**
Children 6-59 months	(58%)
Adolescent Girls 15-19 yrs	(54%)
Adolescent Boys 15-19 yrs	(29%)
Women of Reproductive Age	(53%)
Pregnant Women	(50%)
Lactating Women	(58%)

Source: National Family Health Survey 4

Strategies to combat anaemia

The national nutritional anaemia prophylaxis program (NNAPP) for iron and folic acid supplementation in pregnancy was started in 1970 to address the prevalence of anaemia and to give prophylaxis and treatment to mothers and young children .The NNAPP was then renamed as NNACP with a focus on management rather than prevention of anaemia.

Integrated child development scheme (ICDS) was developed in 1975 for the health and wellbeing of mothers and children under the age of six through the means of nutrition education. A National Nutrition Policy was launched in 1993, with the broad objective to

address the problem of under-nutrition/malnutrition through multi-sectoral strategies. A 12 –by-12 a joint initiative by MOHFW, WHO, UNICEF, FOGSI was launched in 2007 with a goal to ensure that every child would have haemoglobin of 12 gram by the age of 12 years by 2012.Under this scheme all children of age group 10-14 yrs with haemoglobin below 12gms% were given weekly IFA supplementation weekly (Bhatia *et al*., 2018).

On the global front the 65th world health assembly in 2012 approved an action plan with specific targets for maternal, infant and child nutrition and committed to reduce the prevalence of anaemia in 2011 by half in women of reproductive age by 2025 (Stevens *et al.,* 2013). National Iron Plus Initiative (NIPI) was set up in 2013 to reduce the incidence and prevalence of iron deficiency anaemia in adolescents and women in the reproductive age group. Under the NIPI framework a comprehensive package of care along with treatment and management of anaemia was developed. NIPI allows for the decentralised procurement and distribution of IFA according to the requirements of the population. Under this program children aged 6-60 months are administered IFA biweekly by ASHA. Children aged 5-10 yrs are administered weekly by aganwadi workers. Weekly iron and folic acid supplementation cover 11.2 crore beneficiaries in 6th to 12th class who are administered UFA under supervision in schools (Kapil *et al*., 2019).

A National Nutrition Mission (POSHAN) launched in 2018 to address nutrition issues through a mission mode approach under the Ministry of Women & Child Development (MWCD). Two of the five targets of the POSHAN Abhiyaan are directly linked to the reduction of anaemia.

Anaemia Mukt Bharat (AMB)

Launched on 14th April 2018 the AMB programme implements the 6x6x6 strategy i.e. six age groups, six interventions, six institutional mechanisms. The program aims to cover 450 million beneficiaries with specific targets for year 2022.Estimation of beneficiaries will be annually revised and updated. The Anaemia Mukt Bharat strategy will be implemented across all blocks, villages and districts of all the states and union territories of India through existing programs and delivery systems.

- The beneficiaries are children 6-59 months, children 5-9 years, adolescent girls and boys (10-19 years), women of reproductive age (15-49 years), pregnant women, lactating mothers.
- The interventions under this program are iron folic acid supplementation, deworming, behaviour change communication campaign, iron folic acid fortified food, screening and treatment of malaria in endemic pockets.
- The mechanisms are intra-ministerial coordination and convergence, advanced research on anaemia control, supply chain and logistics, national Anaemia Mukt Bharat unit, Anaemia Mukt Bharat dashboard (*Anaemia Mukt Bharat | A Programme by Ministry of Health and UNICEF*, 2020)

Discussion

Anaemia is a public health problem that needs immediate and urgent action both at national and at state level, the prevention of anaemia would substantially improve the health outcomes of the country.

India was among the first developing countries to initiate iron and folic acid supplementation on a nationwide program basis however due to the problems in the coverage and compliance of the covered beneficiaries, the target of reducing anaemia could not be achieved.(Nair *et al*., 2020)

NFHS 2 in 1998-99 for the first time estimated the state specific prevalence of anaemia and its severity in pregnancy. All the NFHS survey identified and graded anaemia according to the WHO standards Finding from NFHS survey show a reduction in prevalence of anaemia from 58.3% (NFHS 3) to 50.3% (NFHS-4). However, when compared with the data from NFHS 2 there was no decline in prevalence of anaemia in over last two decades (Ramachandran and Kalaivani, 2018). This could be contributed to the gaps in the implementation of the national as well as state programs targeting anaemia. The coverage of iron supplementation has shown some improvements and have been responsible to some extent in improving the haemoglobin status of the population.

It is important to note that given the demographic diversity of our country the anaemia indicators need to be adjusted or considerably be realigned according to the place of residence ,age, gender , socio- economic status and other health indicators and accordingly an evidence based approach needs to be adopted .

According to the survey NFHS 4 over 50% of pregnant women were diagnosed as anaemic, it was recorded that an average of only 30.3% of mothers consumed IFA for 100 days or more .Moreover non-pregnant anaemic women in rural India, remain undiagnosed for various reasons.(Rai *et al*., 2018)

The main intervention for control of anaemia since long has been iron and folic acid supplementation. But this needs to be adapted keeping in mind the multifactorial causes of anaemia, as the contribution of iron deficiency in the etiology of anaemia is 14% for children and 16% for WRA women of reproductive age (Kapil *et al*., 2019). As seen in the WIFS program IFA supplementation cannot be continued yearlong due to holidays, and examinations as a result of which the beneficiaries to do not get the complete recommended weekly dosage.

Interventions to stop child marriage and thereby early pregnancy, increased intervals between births will go a long way in reducing incidence of anaemia .Food fortification with iron needs to be expanded , currently 76 countries have mandatory flour fortification i.e. 31% of wheat is fortified globally , however the issue is that the staple diet of most Asian countries is rice which is not fortified on such an extensive manner(Mason *et al*., 2013)

Alternate strategies need to be discovered and developed which come under a common umbrella encompassing all the aspects of nutrition needs to be developed and promoted.

Identifying challenges

- There is barely any contact between the child and the primary healthcare system in context to nutrition monitoring (except for immunization by the ANM and visits by the ASHA worker in case of sickness) till the child is 3 years old (Paul *et al*., 2018). This time period with the lack of supervision in many cases proves to be most detrimental to the health of the child due to inadequate nutrition which may manifest as anaemia in the future.
- Lack of geographic convergence and coordination among the frontline workers responsible for delivering public health and nutrition services (Paul *et a*l., 2018).
- Lack of targeted feedback to state governments on program gaps and specific solutions.

- The overburdened front-line workers who are entrusted with various tasks, need proper supervision and monitoring to handle the effective and timely delivery of iron-based supplements.
- An increased emphasis on Iron and Folic acid (IFA) supplementation alone does not work as the only prime control strategy. There is a need to understand the multifactorial causation of anaemia and to develop a strategy to combat all the factors in a strategic way.
- The current tools used for the assessment of anaemia on field and practice fail to correctly describe the true estimates of anaemia prevalence. The validity of the reading obtained by Hemocure which is currently used in NFHS survey is questionable.

Suggestions

Main aim should be to prevent the occurrence of anaemia in pregnant females to break the generational trend of anaemia i)ICDS which is the largest national development scheme in the world has a wide reach which can be utilised in a better manner to cover the beneficiaries ii) Incentives based approach with the use of cash transfer schemes both to the provider and the recipient iii) Community engagement at village and block level in a way that the program becomes a people's movement iv) Improved monitoring and report systems, aided by a strong technological support network v) Increased food fortification, diversification and promotion of food items with high bioavailability of iron vi) Periodic assessment, trainings to improve in data reporting and data quality.

To combat anemia an evidence-based approach will prove to be the best way forward, keeping in mind the multifactorial nature of anemia and its increased prevalence in India.

Conclusion

Anaemia is the most common nutritional deficiency in Indian population. India's women population and children are most affected. Many programmes are being run by the government of India, however, there is no convergence of these programmes. As a result, the results of all the programmes are fragmented and disproportionate. The targeted management and delivery of quality services should be done in a way that health promotion, disease prevention, diagnosis, treatment and management take the front seat through the

different levels of care within the public health system of India. The anaemia prevention program needs a people-centred approach of comprehensive service delivery that can be tailored to the demographic trends in India.

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PART II

COURSE REPORT

ONLINE COURSE REPORT

Course name – Health Systems Strengthening

Course by – The University of Melbourne

Course type – MOOC

Course language – English

Course description – The course is eight weeks long. Within each week, there are three to four activities all designed to impart skills and knowledge needed to understand and work to strengthen health systems.

Course objectives-

- To explore the health systems and the systems approach in health.
- To apply systems thinking to health systems strengthening (HSS).
- Understanding major health system frameworks, analysing system inequities, and need for HSS approaches.
- To gain the knowledge and skills necessary to develop HSS approach across areas such as health policy and financing, human resources, supply chain management, quality of care and private sector engagement.

Course methodology – The course was conducted via short videos of lectures and a written description. Also available are professional interactions, Case studies, Debates and panel discussions.

Course contents –

- Week 1: Introduction
  History and evolution of health systems
- Week 2: Equity
  Defining and measuring equity, identification of sources of inequity.
- Week 3: Levels of Health Systems Strengthening (HSS)
  Examination of the subnational health systems, community health systems and their structures and mechanisms.
- Week 4: Finance in healthcare

Health financing functions: collection; pooling; purchasing; and payment and sources of health care financing: out of pocket payments; health insurance and government and donor funding.

- Week 5: Human Resources

  Uneven distribution of health workers and factors influencing this distribution, Regulation and management of the health workforce.

- Week 6: Supply chain management

  Supply chain management, determinants of weak supply chains.

- Week 7: Quality of healthcare

  Measurement of quality, relationship between quality and strengthening of health system.

- Week 8: Mixed health system

  Examining the mixed healthcare systems in low- and middle-income countries, role of private health providers.

Key learnings from the course

- The concept of universal health coverage and Primary Health Care approach.
- Widely used frameworks for health systems and systems strengthening, including the World Bank and WHO frameworks, and understanding the health systems as a complex adaptive system.
- Inequities of service delivery and health outcomes.
- Community level systems and participatory governance. The role of communities, regarding the different ways communities can engage with health systems to affect accountability, transparency, and their right to health.
- Principal components of health care financing: collection, pooling, purchasing, and payment.
- Management of the health workforce.
- The supply chain elements and addressing the complex health system determinants of weak supply chains.
- The link between quality of care and health systems strengthening.
- Mixed health systems in low- and middle-income countries, and how do they influence health services.