

Higher Education: a platform for imparting the knowledge of nutrition among adolescent girls, helps in reduction of iron deficiency anaemia in India

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Abstract: Every fifth person in India is an adolescent (Census report, 2011). Investing in this segment of population would definitely help the country to achieve its sustainable millennium development goals. Iron deficiency anaemia (IDA) is one of the major public health nutrition concerns in the low middle income countries like India. National Family Health Survey-3 data shows that anaemia is widely prevalent among all age groups, but one of the major vulnerable groups is adolescent girls (15–19 years) where prevalence of IDA is 56 %. If this population get effected by the IDA that will substantially affect the growth of the country. Because, IDA leads to poor cognitive development, impaired sexual and reproductive development, and reduced physical activity. Iron deficiency is thought to be the most common cause of anaemia globally. Anaemia is a condition in which the number of red blood cells (RBCs), and consequently their oxygen-carrying capacity, is insufficient to meet the body's physiological needs. Several strategies like supplementation, food fortification has been taken up to fight against the IDA, but most of the approach remains unfruitful. Recent studies showed that dietary diversification is the only effective and sustainable strategy for combatting against the IDA. Preparation of a balanced diversified diet needs skill and knowledge of nutrition. Higher education is the platform from where this kind of skill and knowledge can be imparted to the target group for mitigating the problem of IDA. Thus with the changing global scenario the institution come under the domain of higher education if takes up the new challenges and does the cutting age research towards the betterment of its countrymen, the social objectives of higher education can be achieved.

Index Terms - Iron deficiency anaemia, adolescent girls, red blood cell, and nutritional status

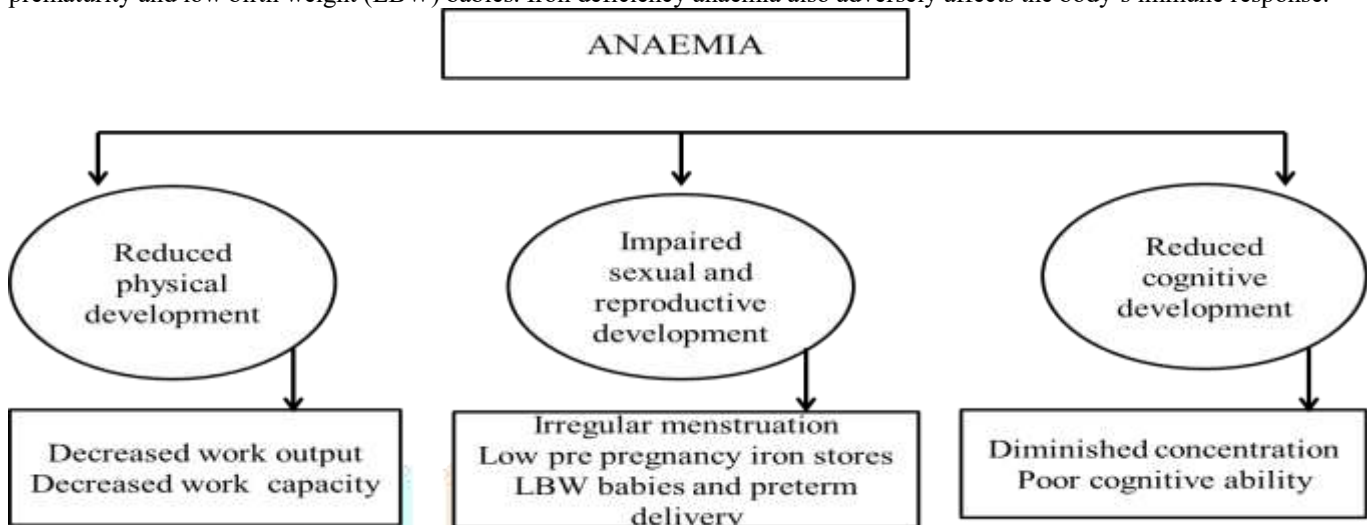
I. INTRODUCTION

India has the largest world youth population, every third person in India is 10-24 years of age. Report suggested that in 2050 number of total youth population in India will be much higher than most of the developed countries. Significantly every fifth person in India is an adolescent (Census, 2011), the number of adolescents contribute to the youth population is large enough and among these adolescent population 33% are girls which cannot be overlooked. This huge number of young population would definitely improve the demographic dividend of the country. But in India where the population explosion took place without having any plan to deal with it. That made an obvious situation, where the interest of the youth is being largely neglected. Investing on this population is one of the primary concerns not only for India but also for all the low middle income countries to achieve their sustainable millennium development goals. Various national and international agencies reported that India's youth population particularly young adolescent girls are suffering from iron deficiency anaemia (IDA) (NFHS-3). IDA is one of the major public health nutrition concerns in this country. IDA still remains a major confounder which refrain the young population to take part actively for building a better nation. In this review the role higher education sector particularly Internal Quality Assurance Cell of the higher education institute, in mitting the IDA among adolescent girls has been discussed rationally.

II. IRON DEFICIENCY ANAEMIA AND ITS CONSEQUENCES

Anaemia is a condition in which the number of red blood cells (RBCs), and consequently their oxygen-carrying capacity, is insufficient to meet the body's physiological needs. The function of the RBCs is to deliver oxygen from the lungs to the tissues and carbon dioxide from the tissues to the lungs. This is accomplished by using haemoglobin (Hb), a tetramer protein composed of haem and globin. Anaemia impairs the body's ability for gas exchange by decreasing the number of RBCs transporting oxygen and carbon dioxide. Anaemia results from one or more of the following process: defective red cell production, increased red cell destruction or blood loss. Iron is necessary for synthesis of haemoglobin. Iron deficiency is thought to be the most common cause of anaemia globally, but other nutritional deficiencies (including folate, vitamin B12 and vitamin A), acute and chronic inflammation, parasitic infections, and inherited or acquired disorders that affect Hb synthesis, red blood cell production or red blood cell survival can all cause

anaemia. Iron deficiency anaemia results in impaired cognitive and motor development in children and decreased work capacity in adults. The effects are most severe in infancy and early childhood. In pregnancy iron deficiency anaemia can lead to perinatal loss, prematurity and low birth weight (LBW) babies. Iron deficiency anaemia also adversely affects the body's immune response.



Fig; 1; adverse effect of iron deficiency anaemia

III. INDIAN SCENARIO OF IRON DEFICIENCY ANAEMIA AMONG ADOLESCENT GIRLS

The word adolescence is derived from the Latin word, 'adolescere'; meaning "to grow, to mature". The WHO has defined adolescence as the age period between 10 to 19 years of age for both the sexes (married and unmarried). There are about 1.2 billion adolescents in the world, which is equal to 1/5th of the world's population and their numbers are increasing. Out of these, 5 million adolescents are living in developing countries. India's population has reached the 1 billion mark, out of which 21% are adolescents.

Adolescence more broadly refers to the phase of human development which encompasses the transition from childhood to adulthood. This period is very crucial, since these are the formative years in the life of an individual, when major physical, psychological and behavioral changes take place. The nutritional and the health needs of the adolescents are also more because of the growth spurt and the increase in physical activity in them.

In females, adolescence marks the beginning of the menstrual cycle or reproduction. Adolescents gain 30% of their adult weight and more than 20% of their adult height between 10-19 years, which we call as growth spurt.

Adolescent girls are at a high risk for anaemia and malnutrition. Inadequate nutrition during adolescence can have serious consequences throughout the reproductive years of life and beyond. Very often, in India, girls get married and pregnant even before the growth period is over, thus doubling the risk for anaemia.

The prevalence of anaemia among girls (Hb <12g %) and boys (Hb <13g %) is alarmingly high as per the reports of NFHS-3 and the National Nutrition Monitoring Bureau Survey (NNMBS). Over 55 per cent of adolescent girls are anaemic. Percentage prevalence of anaemia among adolescent girls in the age group 15–19 years and in the older age group 20–29 years remains almost stagnant at 55.8 per cent and 56.1 per cent respectively. On the other hand, among adolescent boys, prevalence of anaemia for the age group 15–19 years is higher (30.2%) than the post-adolescence stage (19.3 per cent for the age group 20–29 years).

The nutritional anaemia in adolescent girls attributes to the high maternal mortality rate, the high incidence of low birth weight babies, high perinatal mortality and the consequent high fertility rates. This phase of life is also important due to the ever-increasing evidence that the control of anaemia in pregnant women can be more easily achieved if a satisfactory iron status can be ensured during adolescence. About 43% of the adolescent deaths are related to pregnancy. Pregnancy during adolescence deprives the girls from achieving their full growth according to their genetic potential.

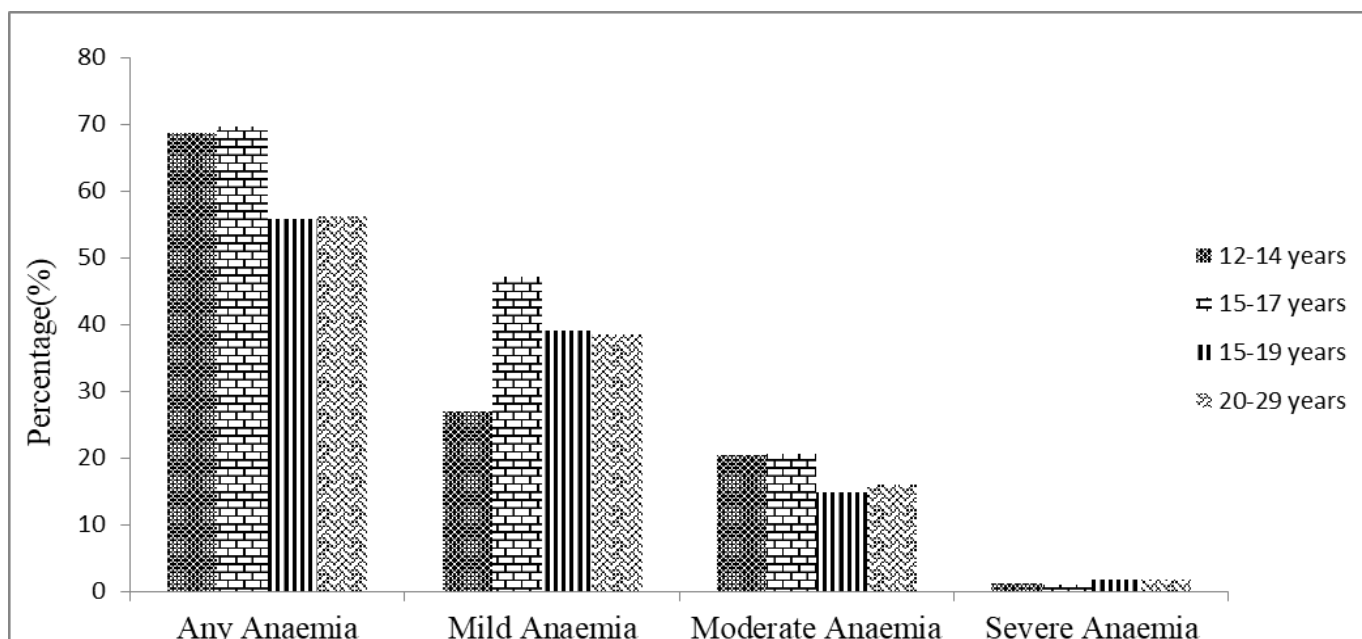


Fig. 2: Prevalence of anaemia among adolescent girls (12-19 years)

IV. STRATEGIES FOR PREVENTION OF IRON DEFICIENCY ANAEMIA

Anaemia is a multi-factorial disorder that requires a multi-pronged approach for its prevention and treatment. Iron deficiency and infections are the most prevalent etiological factors. However, other conditions may have a contributory role. The Copenhagen Consensus (2004) panel of eminent economists concluded that the returns of investing in micronutrient programmes (including iron), among a list of 17 possible development investments, are second only to those of fighting HIV/AIDS. The benefit-to-cost ratio of iron interventions based on resource savings, improvement in cognitive development and schooling, and physical productivity was estimated to be as high as 200:1

Prevention of both iron deficiency and anaemia require approaches that address all the potential causative factors. Interventions to prevent and correct iron deficiency and IDA, therefore, must include measures to increase iron intake through food-based approaches, namely dietary diversification and food fortification with iron; iron supplementation and improved health services and sanitation. But the various meta-analyses have been showed that the dietary diversification is the only and effective sustainable approach to combat against the iron deficiency anaemia in low middle income countries.

V. DIETARY DIVERSIFICATION

Dietary diversification is encouraging the consumption of micronutrient rich foods – dark green leafy vegetables, lentils and vitamin C rich fruits which may be available but are underutilised by the deficient population. To achieve dietary adequacy of iron by using food-based approaches, food preparation and dietary practices must be considered. As iron is low in cereal and tuber-based diets, the addition of legumes can slightly improve the iron content of those diets. However, the bio-availability of this non-haem iron source is low. Therefore, it is not possible to meet the recommended levels of iron and zinc in the staple-based diets through a food-based approach unless some meat, fish, poultry is included or vegetables rich in vitamin C, folate, and other water-soluble or heat-labile vitamins be minimally cooked in small amounts of water. Following this strategy, it is recommended to increase the intake of germinated seeds, fermented cereals, heat-processed cereals, meats, and fruits and vegetables rich in vitamin C and to encourage the consumption of tea, coffee, chocolate, or herbal teas at times other than with meals. Therefore, the adequacy i. e. bioavailability of iron in usual diets can be improved by altering meal patterns to favour enhancers, lower inhibitors, or both. But the success of this approach is largely dependent on the advocacy of nutrition education among the population particularly among the adolescents.

VI. RELEVANCE OF NUTRITION EDUCATION

In the developing countries like India the importance of nutrition education cannot be ignored where the fruit of the nutrition awareness should reach to the most ignorant population of the country. Some of the studies conducted around the world showed the importances of nutrition education in mitigating iron deficiency anaemia are given here;

Hafzan Yousuf et al, 2013, Iran, Multimedia nutrition education program is practical and effective in improving awareness on iron deficiency among anaemic adolescents.

Manjeet Kaur et al, 2012, India, Nutrition education is one of the appropriate, effective and sustainable approaches to combat iron deficiency anaemia.

Maria Nieves Gracia Casal et al, 2011, Venezuela, Nutritional education initiatives and programs have an impact improving nutritional health in adolescent girls.

Alahofe. H et al, 2009, Benin, Nutrition knowledge is effective to improve dietary changes, which helps in anaemia reduction.

All the mentioned studies conducted in developing countries showed a positive correlation between imparting the nutrition education and reduction in iron deficiency anaemia among adolescent girls. Therefore nutrition education can definitely be used as a tool in higher education especially in IQAC to address the nutritional challenges among the adolescents in this country.

VII. IMPACT OF HIGHER EDUCATION; ROLE OF IQAC

Universal declaration of human rights pointed out that for achieving the goal of the sustainable development for any developing country focus must be given on education to enable the youth especially the adolescents. Quality education brings the access to explore the future opportunities, improves the decision making ability. Skills imparted through education increase the employability. Further employment gives the economic protection, which improves the health status of the individuals. Institutions like research institute, universities, colleges etc. comes under the higher education domain must act towards executing the real purpose of education and nourish the student community in such a way where they can take a part in building the nation.

In 1994, UGC established the National Assessment and Accreditation Council (NAAC) for propelling the higher education institutes (HEI) towards the enhancement of quality of teaching and research activities, achieving its social objectives. Different criteria were formed to evaluate the performance of the HEIs. But this process happens once in every five years. Later on for the installation of constant momentum in HEIs to work on enhancement of the quality of institutes and achieving the social responsibility Internal Quality Assurance Cell (IQAC) was formed.

The role of IQAC can be very instrumental in the overall development of the college/institute. The Principal, being the chairman of IQAC, the co-ordinator of IQAC and its members should be able to create a conducive atmosphere in terms of core elements stated by NAAC like –teaching and learning, co-curricular and extra-curricular activities, teachers' academic and professional development, research and consultancy, students' supportive services etc. Apart from this IQAC can be a hub from where HEIs can takes up social challenges being faced by the local communities and address them promptly by using major strength of the HEI; the students. Both teachers and students can be the change agent in the society. IQAC of any HEIs have to be instrumental for dissemination of nutrition education among its teachers and student community particularly adolescents and takes part in societal reforms by creating the genuine human resource



Fig: 3: Objectives of IQAC

VIII. CONCLUSION

In India with the changing scenario of higher education system, quality and holistic development of an institution largely depends of the quality of its IQAC. IQAC should navigate the institute to reach out to the community and take leadership for the betterment of community. Nutrition education can help IQAC to achieve its various aspect of community development like, conducting of nutrition counselling session, nutrition awareness camp, village attachment program where the common household sanitation, hygiene practices

can be taught to the villagers particularly adolescent girls, dietary advices can be given to pregnant, lactating mothers by the students and the teachers of HEIs. Another most important domain is nutrition advocacy where IQAC can bridge the gap between different stake holders of nutrition related policies, and be operationalizing the maximum benefit of policies taken by the government in public interest. IQAC if acts in such direction this will be a great success for the Indian modern education system and the outcome of this continuous process will have a sound impact in the society. The youth and adolescent will be benefited through knowledge and skill that will be reflected in their overall development. Hopefully role of IQAC will be broadened in the future and iron deficiency anaemia and many other nutritional challenges can be resolved from this platform.

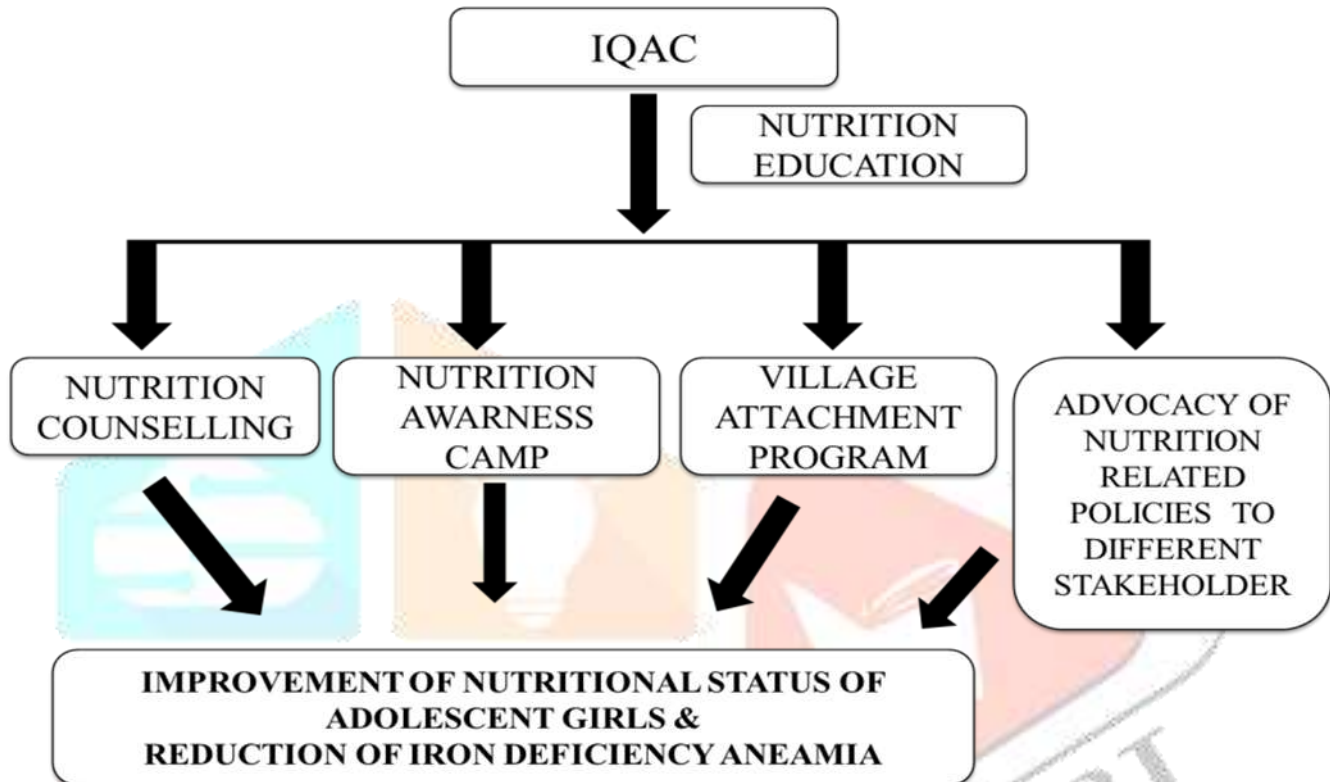


Fig: 4: Possible model for dissemination of nutrition education by IQAC

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