



ORIGINAL RESEARCH PAPER

Public Health

A QUARTET OF ADOLESCENT HEALTH -WIFS, DIET, MENSTRUAL BLOOD LOSS, DE-WORM- & HOMOEOPATHY

KEY WORDS: WIFS, Homoeopathy, MHM, NIPI, Adolescent health

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ABSTRACT

^{1,16,24,28}You are asked to name some prominent adolescents across the globe and the names of Greta, Billie Elish and Malala will pop up in your mind. The current article envisages that all adolescents optimize themselves to their full potential. It explores all the dimensions as to why this does not happen through the lens of adolescent health and related programs. Adolescent constitute about 16.2% of the population where 7.6% are girls and 8.6% are boys. The current article looks at both adolescent girls and boys through the public health programs and the components of adolescent health especially through the National Health Mission (NHM). The article explores the role of Homoeopathy in the quartet of adolescent health in UP and India. The contents of the quartet are Weekly Iron and Folic acid Supplement (WIFS), Diet, Menstrual Blood Loss & De-Worm. Further, it elicits the role of Homoeopathy in Rashtriya Kishor Swasthya Karyakram (RKSK) and components of adolescent health in UP and India. The first is the provision of WIFS in adolescent health primarily to prevent, control and treat anemia. The second aspect is the diet of adolescent health at the House Hold level. The third part is the issue of blood loss during menstrual cycle and here a triangulation approach is followed among the components such as WIFS, Blood Loss and the Diet at HH level. The fourth and the last portion is the concept of de-worm among adolescents. There are references to all these issues while reflecting upon the recent studies among the quartet. Finally, the article explores the role of AYUSH in adolescent health where especially it highlights on Homoeopathic therapeutics in the adolescent health arena.

INTRODUCTION^{2,11,13,18,23}

The striking news about adolescent health is that the National Family Health Survey (NFHS) 5 data done in 2019-20 has shown an increase in anemia among adolescent girls by 5% when compared to National Family Health Survey (NFHS) 4. It was expected that the levels of anemia should have decreased since the country had National Iron Plus Initiative (NIPI) program since 2011 that had adolescent as a major beneficiary. It is time that we should look in to the nutritional requirements of adolescents.

When we look into the nutritional requirements, we find that in the adolescence phase of life, both boys and girls demand a lot of nutrition intake. As girls face more physiological

demands, they require a higher intake of macro and micro nutrients. Therefore, 40% of adolescent girls are prone to anemia while only 18% of adolescent boys are prone to anemia.

The adolescent's nutritional status is related to the burden of multiple micronutrient deficiencies. Currently, 80% of adolescents suffer 'hidden hunger' due to micro nutrient deficiencies. Over 10% of adolescents are overweight in 12 States of India.

When we delve in to the causes of this situation, we find that as per the Comprehensive National Nutrition Survey 2019, the consumption of diverse food groups among adolescents

was low even before the pandemic.

The COVID-19 has further worsened **dietary diversity**, especially of women, adolescents and children. For example, as per a study, women's dietary diversity in India declined by 42% during COVID-19 lockdowns as they consumed fewer fruits, vegetables, and eggs.

The lockdowns have led to the loss of **mid-day meals due to closure of schools**, interruptions in **Weekly Iron Folic Acid Supplementation (WIFS)** and nutrition education in schools for adolescent girls. The **out-of-school adolescent girls** were even more vulnerable to poor nutrition outcomes.

A Peep Into the Past on Adolescent Health^{3,4,5,6,7,8,10,11,12,13,14,16,17}

In this section, the historical perspective of adolescent health programs is discussed at global level in the beginning thereby progressing to the current status in India and in UP. Box number 1 shows the time line of adolescent health care including the components of the program in India at a glance.

Box number 1- Road to adolescent health in India

- 1970- National Nutritional Anemia Prophylaxis Program (NNAPP) initiated and adolescents were one category of beneficiary
- November 1991- Kishori Shakti Yojana launched by ICDS of WCD ministry
- 1997- Reproductive Sexual and Child Health (RCH) program launched in response to International Conference on Population and Development in 1994.
- 1997- Balika Samridhi Yojana for girls born on or after August 15th 1997 (BPL families)
- 2005- Adolescent Reproductive Sexual Health Program launched.
- 2007- Second National Health Policy's focus on adolescents
- 2011- Rajiv Gandhi Scheme for Empowerment of Adolescent Girls, SABLA
- 2011- National Iron Plus Initiative (NIPI) program launched that also included the 10-19 years as a beneficiary group.
- 2013- Committee on the Rights of Child and Adolescents formed by WHO
- 2013- RMNCH+A framework launched in 184 high priority districts in February.
- 2014- WHO report on health for the world's adolescents released.
- January 7th 2014- Rashtriya Kshor Swasthya Karyakram launched.
- 2015- UN's SDG includes adolescent health in its agenda till 2030.
- 2016- Rapid Program Review of ARSH & RKSK in states of Haryana, Madhya Pradesh, Maharashtra and Uttarakhand.
- 2017- 3rd NHP focuses on health of adolescents and investing in their health care.
- 2018- Anemia Free India/Anemia Mukta Bharat (AMB) initiated in which adolescents were a major beneficiary.
- 2018- Comprehensive National Nutrition Survey (CNNS) done for adolescents in the country.

Literature Review^{11,12,13,21,22,23,24}

The current article is in the area of adolescent health. The 10-19 year age group is critical as it is a transitional stage in life. Tracing the history of the adolescent health programs in India is the base of the article. Needless to say, initially the entire adolescent health intervention was based on the roll out of anemia related programs in the country.

Currently, the Anemia Free India (Anemia Mukta Bharat in Hindi) and its 6x6x6 strategy is operational in the country. The first 6 means 6 types of interventions, the second 6 means 6 types of institutional mechanisms and the third 6 means 6 types of beneficiaries in which the adolescents are a major

beneficiary. Earlier, to prevent anemia among adolescents, the government of India launched National Iron Plus Initiative (NIPI) program in 2011. This was a successor to the National Nutritional Anemia Prophylaxis Program (NNAPP) of 1970. The beneficiaries of NIPI were children in 0-59 months, 5-10 year, adolescents aged 10-19 year, pregnant and lactating women and women in the reproductive age group.

During 2016-2018, the government of India did the Comprehensive National Nutrition Survey (CNNS) on adolescent health which had a detailed profile on the health status of the adolescents. For example, In India, on analyzing the diet pattern of adolescents, the survey informs us that 55.4% of 10-19 year age group takes vegetarian without eggs and only 8.2% take vegetarian diets with eggs. The following table gives a glimpse of the status of adolescents in the state of UP. The data of the state of UP is given since the title involves the state along with India. The data clearly reflects that the dietary practices of the adolescents are poor in UP at the House Hold (HH) level.

Table 2- Some of the indicators of CNNS for the state of UP

Target population	Indicator	Percentage
10-19 year age group	Severely thin	22.5
10-19 year age group	Obese	0.4
10-19 year age group	Anemic	31.6
10-19 year age group	Folate deficiency	5.2
10-19 year age group	Vitamin B 12 deficiency	42.1
10-19 year age group	Vitamin D deficiency	19.4
10-19 year age group	Vitamin A deficiency	18.8
10-19 year age group	Zinc deficiency	26.3
10-19 year age group	High HbA1c (Pre-Diabetic)	4.5
10-19 year age group	High Triglycerides	16.1
10-19 year age group	High Serum Creatinine	8.1

The concept and importance of de-worming was recently spelt out by Prof. Michael Kremer who was a visitor to WHO recently in 2023. He has received the Nobel prize in economics in 2019 along with Prof. Esther Duflo and Prof. Abhijit Banerjee. Their work was at University of Chicago where they worked on de-worming and Water Sanitation and Hygiene (WASH) and its impact on child health.

Regarding the concept of de-worm, it starts at the 0-5 year age group and extends to the adolescents. Studies in Kenya which were followed for 20 years it was found that children who receive d de-worming treatment earned 14% more as adults. Further, study in south United States in early 20th century on the results of treating children found improvements in child education, literacy and their earning as adults. De-worming costs about 50 cents per child per year. De-wormed children have a higher rate of shifting from agricultural to non-agricultural activities and are able to obtain better wages.

De-worming also benefits weight, mid upper arm circumference and height and hemoglobin. Similarly, de-worming treatment of mothers during pregnancy reduced by 14% the risk of their child dying within the first 4 weeks after birth. Treating pregnant women with anthelmintic medicines can also avoid low birth weight.

In this background, the National De-worming Day was initiated on 10th February 2015 and continues till date. The target group is all children, adolescents and adults in 1-19 year age group where the states of Rajasthan and Madhya Pradesh held the round annually as they have reported an incidence of Soil Transmitted Helminths (STH) less than 20%. Rest all the states and Union Territories held it bi-annually.

Adolescent health in RMNCH+A framework^{16,26,27,28}

The Reproductive, Maternal, Neonatal, Child health plus Adolescents (RMNCH+A) frame work was launched since February 2013 in 29 states and 184 High Priority Districts

(HPD). For adolescent health, it focused on teenage pregnancies and tries to increase contraceptive prevalence. Further, there is provision of community based services through peer education. It also puts an effort to strengthen Adolescent Reproductive and Sexual Health (ARSH) clinics in L3 facilities like District Hospitals (DH) and above. Next is the roll out of NIPI including WIFS. Lastly, it focuses on Menstrual Hygiene Management (MHM).

Regarding services, Adolescent Friendly Health Services (AFHS) are also available in L3 facilities only. L1 facilities are Sub-Centers (SC) or Health & Wellness Centers and Primary Health Centers (PHC) that are non-24X7 and that have 10 deliveries per month on an average per month. The L2 facilities are the 24X7 PHCs and the non-First Referral Unit (FRU) Community Health Centers (CHC). The L3 facilities are the CHCs with FRUs and the DHs. The concept of these three type of facilities was initiated in 2012.

The list of minimum support services at these three type of facilities include tablet Albendazole as a de-worm, tablet Dicyclomine as an antispasmodic for dysmenorrheal and provision of sanitary napkins like the Suvidha pads that are available at Pradhan Mantri Jan Ausadhi Kendras (PMJAK) of the Pradhan Mantri Bharatiya Jan Ausadhi Pariyojana (PMBJP). The Pradhan Mantri Jan Ausadhi Yojana (PMJAY) was initiated in November 2008 by the Department of Petro Chemicals, Ministry of Petrochemicals and Fertilizers. It was renamed as PMBJP in November 2016.

Menstrual Bleeding⁹

A study in 2012 that empirically evaluated menstrual bleeding patterns and their association with hormonal levels among healthy young women not trying to conceive and self reported regular menstrual cycles deduced that women bled for a median of 5 days during menstruation. Further, the study also reported that the first three days typically reported as heavy bleeding. Anovulatory cycles were followed by decreased blood loss and shorter menses length while higher FSH and progesterone levels were associated with higher bleeding.

The current article exclusively focuses on the blood loss and iron requirement and the dietary practices of adolescents.

Iron loss and Menstrual Cycle^{12,19,20,33}

The range of blood loss during a menstrual cycle is 30-180 ml which indicates that the some women bleed only 30 ml of blood during their monthly cycle while some bleed up to 180ml. The average blood loss is 80 ml per monthly cycle. Another 2013 study concluded that healthy women with normal senses lose on average 1.2 mg of Iron per cycle.

A study in Nigeria concluded that per 40 ml loss of blood, there is 1.6 mg loss of Iron. Hence, per average bleeding i.e. 80 ml, the loss of iron is 3.2 mg. Again per bleeding of 160ml, the iron loss would be 6.4mg. So per the least bleeding of 30ml, the loss of iron will be 1.2 mg. From this we can infer that the least iron loss per monthly cycle is 1.2mg and the maximum loss per monthly cycle is 7.2mg.

To address this loss, for adolescents, Weekly Iron and Folic acid Supplements (WIFS) where 60mg of Iron & 500mcg Folic acid tablet is given every week. Actually in mg, it will be 60.5 mg per week. Hence, per month, these 4 tablets provide 242 mg of iron per month. We know from above that the average loss of blood monthly through the menstrual cycle is 80ml i.e. 3.2 mg of Iron per month.

The Recommended Daily or Dietary Allowance of iron as given by National Institute of Health (NIH), India per age group is given in the table below.

Age group	Male	Female
Births to 6 months	0.27 mg	0.27mg
7-12 months	11mg	11mg
1-3 years	7mg	7mg
4-8 years	10mg	10mg
9-13 years	8mg	8mg
14-18 years	11mg	15mg
19-50 years	8mg	18mg
51+ years	8mg	8mg

From the table, we can infer that during adolescence, i.e. 14-18 years, the girls need 4 mg iron more than the boys. Again in middle age i.e. 19-50 years, the need of iron for females 10 mg more than males.

Further, the NIH informs that in the 2-11 year age group, the RDA of iron is 13.7 to 15.1mg per day. In the 12-19 year age group, the need is 16.3mg per day. In age group of more than 19 years, for men the need is 19.3 to 20.5mg per day. Similarly in this age group, for females the need is 17.0 to 18.9 mg per day. The median RDA of iron during pregnancy is 14.7 mg per day.

For three special stages of life, the RDAs are different for each of the stages. For pregnant women in the age group of 14-18 years, the need is 27 mg per day and for 19-50 years also the need is same. Similarly for lactation, the needs for both these age groups are 10mg and 9mg respectively.

For the adolescent age group of 12-19 years, the daily requirement is 16.3mg and hence, for the entire month, the requirement is 16.3mg*30=489.0 mg. The average iron loss per month is 3.2 mg through 80ml blood loss. So the compensatory requirement per month is 489.0+3.2=492.2mg. The actual available level in a month is 489.0-3.2=485.8mg.

WIFS provides 242mg per month through 60.5mg per week as mentioned above. Hence, WIFS provides 242/486 (485.8 rounded)*100= 49.79% or rounded to 50%. So WIFS provides only 50% of the iron need of the body for adolescent girls per month. Rest 50% iron should come from the diet. The actual situation of anemia is mentioned through the example of the state of UP through the CNNS data. In the introductory section, the reasons are also touched upon.

The real problem is that anemia is multi factorial even in causes related to deficiencies. Besides Iron, Copper, Vitamin B12, Zinc and other micronutrient deficiencies also cause anemia.

Adolescent Health & Homoeopathy in Public Domain^{31,32,15}

Currently, the Essential Drug List of Homoeopathy, Department of AYUSH shows one category that includes adolescents. The category is menstrual and reproductive problems. Under various color categories, the potencies of each medicine are coded. The color seven highlighters only suggests to use the medicine in these potencies from a list of 233 medicines besides the bio-chemic medicines, ointments & drops to be used locally.

Another document in the public domain is the 8th training module of ASHA developed by NHSRC in 2005 for NRHM. The module has a list of common medicines that describes their use in different conditions.

These two documents are vague & hence the need of the hour is to develop a treatment protocol for adolescent care in homoeopathy. It should be developed on the lines of the adolescent health components. The issues of adolescents are to be taken into account while developing the protocol.

Homoeopathic Treatment Protocol^{34,35,36,37,38,15}

Adolescent is a stage of life and here the anemic headache of school girls in Allen's key notes come to the mind under

Table 3- RDAs for Iron in various age groups

Natrum Mur with Calcarea Phos in the bracket. So obviously, these two are appropriate for adolescents if these are indicated in patients. Here, the idea is to give a treatment protocol based on the programmatic framework of adolescents under the NHM.

The protocol adheres to the services provided under RMNCH+A framework for adolescents.

The contraceptive prevalence is to be increased among adolescents. Along with the family planning method that the user is using, homoeopathic medicines like progesterone and estrogen can be given in low potencies so that the hormones like the FSH and LH are controlled in the body.

The second is health education through peer education. Here, the medical officers of the public dispensaries can play the role. They have to be trained on the adolescent's health. Following that, they can conduct sessions among the target groups in the catchment area of the dispensaries.

The third is to address anemia. Here, Bio Combination number 1 is to be given to everyone, Ferrum Met-3X for iron deficiency anemia, Cuprum Met-3X for Copper deficiency anemia and Cobalt-3X for Vitamin B12 deficiency anemia.

The fourth is provision of antispasmodics for dysmenorrheal. Here medicines like Mag Phos-3X to be given to all, Colocynthis-1000CH for normal bleeding (H/o average blood loss of 80ml), Pulsatilla-1000CH for less bleeding (H/o the lower range blood loss of 30ml) and Cimicifuga-1000CH for heavy bleeding (H/o blood loss of 80ml to 180ml).

The fifth one is de-worming which is critical for the utilization of food by the body. To de-worm the adolescents, Thymolum-3X for hookworm, Filix Mas-Q for tape worm, Kalmegh-Q for pin worm, Kurchi-Q for amoebiasis, Chelone-Q for round worm, Veronia A-Q for trichuris trichura. Chenopodium-Q is to be given as a specific to all the cases.

The last is Menstrual Hygiene Management which includes management of menses, maintaining hygiene and proper disposal of used sanitary pads. The above mentioned medicines can be used for management of menses. Drying of undergarments in the sun and keeping the area clean with a solution of 50 drops of Calendula-Q in one liter of luke warm water can be used for 5 days. Echinacea-Q can be taken in repeated doses in case of any local problem during menses.

Finally, the used pads are to be buried in the ground or are to be incinerated and not thrown in the open. If cloths are used, only clean cotton cloth to be used. The pads or cloths are to be changed every 4-6 hours. The homoeopaths must advice the adolescents to buy the Savidha sanitary pads @₹1 at the Jan Ausadhi Kendras.

For the ARSH clinics, Anti-sycotics like Thuja (to relatively thirsty ones) and Medorrhinum (very thirsty ones) are to be used frequently. The bowel nosode 'Bacilli Coli' or E.Coli is to be used along with these two.

The above-mentioned medicines can also be used as per the need in AFHCs also.

Future-The Way Ahead^{2,15}

During adolescence, **dietary diversity** can be promoted, when **dietary habits** are in the formative stage. The behavior imbibed during adolescence has a higher chance of being continued in adult life. It can correct **nutritional deficiencies** and replenish the body with much-needed nutrients, especially for girls.

Appropriate nutrition should be ensured to the **adolescent girls**. Instead of the entire focus on **WIFS services**, the

government's health and nutrition policies should promote **diverse diets** (like inclusion of millets) and **physical activities**. The UN has already declared 2023 as the year of millets to promote millets consumption.

This can be done with better **school ecosystem** like Nutri-Smart schools having kitchen gardens in schools and strengthen **nutrition counseling** through **community-based** events and Village Health, Sanitation and Nutrition Days that are observed on Wednesdays and Saturdays across UP.

Young girls having **adequate information and knowledge** about appropriate diets can act as **change agents** for their families, community, and peer groups.

Measures like increasing the **legal age of marriage** for women from **18 years to 21 years** is a step that should be encouraged. Further, it should be ensured that girls remain in school or formal education. This will provide opportunities to girls to improve their nutritional and health outcomes.

To address hidden hunger, we need to strengthen our policy initiatives to **address deficiencies** of not just **iron and folic acid**, but also **vitamin B12, vitamin D, and zinc**.

POSHAN 2.0 Mission strongly integrates the aspect of under-nutrition and anemia among women, girls, and children. In addition, issues like non-communicable diseases and obesity among adolescents should also be included.

CONCLUSION¹⁸

The admission of homoeopathy effectively in the field of adolescent care will enrich the homoeopathic students & fraternity as there will be value addition towards understanding epidemiology, morbidity & mortality of adolescent stage. They will continue to practice effectively & be able to deal with new challenges that will continue to emerge in care of adolescents. It is not possible for the community to wait for & rush for care at tertiary facilities for every sick or healthy adolescent. No strategy can be a panacea for the emerging challenges in adolescent care. It is here that the cost effectiveness & clinical effectiveness of Homoeopathy will come handy for the public & private health systems while dealing with masses for a developing country like India. Homoeopathy having proved its mettle in the field of adolescent health will go a long way in arresting & controlling the problems at the transition phase of each life. With a low Total Fertility Rate of 2.1 at the country level which equivalents the replacement level, the adolescents are expected to go through a safe motherhood provided adolescent health is taken care at the appropriate time with quality as well as quantity.

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Conflict of Interest

There is no conflict of interest regarding this article.

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