Section: Community Medicine

Original Research Article

# THE GAME CHANGER ROLE OF MOTHERS (HAVING CHILDREN OF 6 -59 MONTHS) FOR MAKING KANNAUJ AN ANEMIA MUKT DISTRICT: AN INTERVENTIONAL STUDY

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ABSTRACT

**Background:** Anaemia is a significant public health challenge in India. 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[1]. **Objective:** 1. To estimate the effect of anemia mukt bharat utilization services of anaemia in Mothers (having children 6-59 months) in Kannauj district.2. To estimate the effect of anemia mukt bharat utilization services in children 6-59 months in Kannauj district. 3. To see the effects of advocacy of Mothers (having children of 6-59 months) in reducing the prevalence of anaemia in mothers and children.

**Materials and Methods:** This Interventional study was conducted from July 2023 to March 2025 at was conducted in district kannauj in both rural urban areas from department of community medicine Dr BRRA GMC Kannauj. 20 clusters was selected- 10 in urban areas as municipal wards and 10 villages in rural areas by multistage random sampling. It included 189 study subjects i.e i.e Mothers of children 6-59 months and their children in age 6-59 months . a pre tested semi structure interview schedule is used and digital hemoglobinometer for Hb estimation.

**Results:** statistically significant difference is found P value <.05 on applying paired T test between pre and post interventional data of following variables like Hb levels of children of study subjects, levels of Hb of study subjects, knowledge of number of services offered in anemia mukt bharat Abhiyan, knowledge number of food items rich in iron, average duration of IFA supplementation in days.

**Conclusion:** According to this study, the advocacy of mothers of children 6-59 months can significantly affect these values.

**Keywords:** Anemia, Anemia Mukt District, Advocacy of Mothers.

## INTRODUCTION

Anaemia is a significant public health challenge in India. 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. Anemia Mukt Bharat strategy is implemented to reduce anaemia among six beneficiaries age group - children (6-59 months),

children (5-9 years), adolescents (10-19 years), pregnant and lactating women and in women of reproductive age group (15-49 years) in life cycle approach through implementation of six interventions via robust institutional mechanism.[1]
India is one of the countries with anemia as a serious public health concern today. Almost 50 percent of the pregnant women, 59 percent of children under five years of age, 54 percent of adolescent girls and 53 percent of non-pregnant non-lactating women of our country are anemic.[2]

**The six interventions under Anemia Mukt Bharat strategy are as follows.[1]**

i) Prophylactic Iron Folic Acid Supplementation

| Age group | Dose and Regime for IFA supplementation |
|---|---|
| 6 – 59 months of age | • Biweekly, 1 ml Iron and Folic Acid syrup<br>• Each ml of Iron and Folic Acid syrup containing 20 mg elemental Iron + 100 mcg of Folic Acid<br>• Bottle (50ml) to have an 'auto-dispenser' and information leaflet as per MoHFW guidelines in the mono-carton |
| 5- 10 years children | • Weekly, 1 Iron and Folic Acid tablet<br>• Each tablet containing 45 mg elemental Iron + 400 mcg Folic Acid, sugar-coated, pink color |
| School going adolescent girls and boys, 10-19 years of age and Out of school adolescent girls 10-19 years age | • Weekly, 1 Iron and Folic Acid tablet<br>• Each tablet containing 60 mg elemental iron + 500 mcg Folic Acid, sugar-coated, blue color |
| Women of reproductive age (non-pregnant, non-lactating) 20-49 years | • Weekly, 1 Iron and Folic Acid tablet<br>• Each tablet containing 60 mg elemental Iron + 500 mcg Folic Acid, sugar-coated, red color<br>• All women in the reproductive age group in the pre-conception period and upto the first trimester of the pregnancy are advised to have 400 mcg of Folic Acid tablets, daily |
| Pregnant women and lactating mothers (0-6 months child) | • Daily, 1 Iron and Folic Acid tablet starting from the fourth month of pregnancy (that is from the second trimester), continued throughout pregnancy (minimum 180 days during pregnancy) and to be continued for 180 days, post-partum<br>• Each tablet containing 60 mg elemental Iron + 500 mcg Folic Acid, sugar-coated, red color |

**ii. Periodic deworming**

- MoHFW is implementing National Deworming Day (NDD) programme under which biannual mass deworming for children and adolescents in age group 1-19 years is carried on designated dates – 10th February and 10thAugust every year.
- Pregnant women are provided services under the strategy through antenatal care contacts (ANC clinics/ VHND) for deworming (in the second trimester).

**iii.** Intensified year-round Behavior Change Communication Campaign for compliance to IFA and deworming; b) Appropriate Infant and Young Child Feeding (IYCF) with emphasis on adequate and age-appropriate complementary foods for children 6 months and above; c) Increase intake of iron-rich, protein-rich and vitamin C-rich foods; dietary diversification; food fortification; d) Promoting practice of delayed cord clamping.

**iv)** Testing and Treatment of anemia using digital methods (Digital Invasive Haemoglobinometer) in field settings, Sub Health Centres, Health and Wellness Centres; and Semi-auto analyzer in health facilities PHC and above; and point of care treatment. Anemia Management protocols to be followed are mentioned in Operational Guidelines for Anemia Mukt Bharat

**v)** Mandatory provision of Iron and Folic Acid fortified foods in government-funded health programmes.

**vi)** Intensifying awareness, screening and treatment of non-nutritional causes of anaemia in endemic pockets, with special focus on malaria, haemoglobinopathies and fluorosis.

## MATERIALS AND METHODS

Methodology -after approval of project from MRU Kannauj. Ethical approval was taken from GMC, Kannauj Institutional Ethics Committee.

**Sampling technique**

This Interventional study was conducted from July 2023 to March 2025 in district kannauj in both rural urban areas from department of community medicine Dr BRRA GMC Kannauj onducted in district kannauj in both rural amd urban areas simultaneously. Line listing of all study population i.e Mothers of children 6-59 months and their children in age 6-59 months was done with the help of ASHA and AWW.

Sampling methods- 20 clusters was selected- 10 in urban areas as municipal wards and 10 villages in rural areas by multistage random sampling.

**Sample size**: In each cluster all of the study subjects(i.e Mothers of children 6-59 months and their children in age 6-59 months) after follow up i.e. total 189 was selected as universal sampling.

**Inclusion Criteria:** All of the study population i.e Mothers of children 6-59 months and their children in age 6-59 months who give consent to participate and not severely ill.

**Exclusion Criteria:** who is out of inclusion criteria.

**Ethical clearance:** Ethical approval was taken from IEC (Institutional Ethics Committee), GMC Kannauj.

**Methods**

total 220 study subjects who enrolled in study after their informed consent (136 urban 84 rural study subjects 220 combined rural and urban study subjects) were initially taken but 112 urban and 77 rural study subjects after post intervention follow up was done after 6 months of intervention i.e advocacy of mothers, so 189 study subjects and their pre and post paired data was analysed.

Intervention applied – Advocacy of study population by giving them health education to the mothers in **Study Population:** regarding anemia its causes prevention and treatment, nutrition and anemia Mukt Bharat services also helping them to access already available services in Anaemia Mukt Bharat Abhiyaan with the help of ASHA and AWW there.

Statistical Analysis: Data was entered in MS excel and analyzed by using SPSS trial version 23. Post intervention data was taken after 6 months of the intervention and it was compared with the base line data with the help of appropriate tests like paired T test and McNemar to check their significance. The data was analysed by SPSS trial version 23. Statistical significance is indicated by a P-value of" 0.05 or less.

## RESULTS

Out of total children 46.6% were male and 53.4 % were females. Majority 76.2 % of the study population belongs to the hindu religion. Majority 90.5% of study population were housewife by occupation rest 9.5 % were employed in various occupations like farming ,labourer ,business and private jobs. Most of the study population 95.2% during pre-intervention base line data collection don't know what is anemia mukt bharat abhiyan. During post intervention data collection 100 % study subjects know what is anemia mukt bharat abhiyan. Most of the study population 98.4% during pre-intervention base line data collection don't know what are the services in anemia mukt bharat abhiyan. During post intervention data collection 100 % study subjects atleast know one or more services given in anemia mukt bharat abhiyan. Most of the study population 89.9% during pre-intervention base line data collection don't know what are the food items rich in iron. Majority 97.9% denied that any health worker visited them for health education for anemia. Majority of study subjects 82% during their pregnancy tested by digital method of anemia testing. Majority 88.9% had not taken IFA in last one year at pre intervention data collection. there is more 98.9% knowledge of other cause of anemia in study subjects in post intervention period as compared to 2.1 % in pre intervention period and this difference is statistically significant P value <.05 after applying McNemar test. more 98.9% study subjects know the benefits of deworming in anemia in post intervention period as compared to 14.3 % study subjects in pre intervention period and this difference is found to be statistically significant P value <.05 after applying McNemar test .

statistically significant difference is found P value <.05 on applying paired T test between pre and post interventional data of following variables like Hb levels of children of study subjects, levels of Hb of study subjects, average duration of IFA supplementation in days supporting the alternate hypothesis that advocacy of mothers can significantly affect these values.

**1. DISTRIBUTION OF STUDY SUBJECTS (MOTHERS) ACCORDING TO KNOWLEDGE REGARDING ANEMIA and utilisation of services (PRE INTERVENTION base line data)**

| | | |
|---|---|---|
| **Knowledge about what is anemia** | **Yes** | **19(10.1%)** |
| **knowledge about cause of anemia** | **Yes** | **8(4.2%)** |
| **knowledge about anemia mukt bharat** | **Yes** | **9(4.8%)** |
| **knowledge about number of services in anemia mukt bharat** | **Yes** | **3( 1.3 %)** |
| **knowledge about number of iron rich food items** | **Yes** | **19(10.1%)** |
| **health education on anemia by health worker** | **Yes** | **4(2.1%)** |
| **knowledge about symptoms of anemia** | **Yes** | **25(13.2%)** |
| **knowledge of treatment of anaemia** | **Yes** | **17(9%)** |
| **knowledge that women are more prone to anemia** | **Yes** | **27(14.3%)** |
| **knowledge of consequence of anemia in child** | **Yes** | **13(6.9?%)** |
| **perception that having anemia is shameful** | **Yes** | **5(2.6%)** |
| **having tea and coffee after meals** | **Yes** | **14(7.4%)** |
| **Knowledge of tea and coffee decrease iron absorption** | **Yes** | **4(2.1%)** |
| **Digital testing in anemia during pregnancy** | **Yes** | **155(82%)** |
| **Hb checked in last one year** | **Yes** | **71(37.5%)** |
| **having IFA in last one year** | **Yes** | **21(11.1%)** |

2. Cross tables showing significant changes in knowledge of mothers and utilisation of services post intervention

a.Table showing Pre and post intervention change in knowledge level of cause of anemia

| Knowledge of other cause of anemia apart from iron deficiency | Pre intervention | Post intervention | McNemar Test P=.000 |
|---|---|---|---|
| Know | 4(2.1) | 187(98.9) | |
| Don't know | 185(97.9) | 2(1.1) | |
| Total | 189 | 189 | |

| Knowledge of other cause of anemia apart from iron deficiency | Pre intervention | Post intervention | **McNemar Test P=.000** |
|---|---|---|---|
| Know | 4(2.1) | 187(98.9) | |
| Don't know | 185(97.9) | 2(1.1) | |
| Total | 189 | 189 | |

From the above table it is seen that there is more 98.9% knowledge of other cause of anemia in study subjects in post intervention period as compared to 2.1 % in pre intervention period and this difference is statistically significant P value <.05 after applying McNemar test .

**b. Pre and post intervention change in knowledge of women are more prone to anemia**

| Knowledge of women are more to anemia | Pre intervention | Post intervention | **McNemar Test P=.000** |
|---|---|---|---|
| **Know** | **27(14.3)** | **187(98.9)** | |
| **Don't know** | **162(85.7)** | **2(1.1)** | |
| **Total** | **189** | **189** | |

From the above table it is seen that there is more 98.9% know that women are more prone to anemia in study subjects in post intervention period as compared to 14.3 % study subjects in pre intervention period and this difference is statistically significant P value <.05 after applying McNemar test .

**c.Pre and post intervention change in Knowledge of tea and coffee decrease iron absorption**

| Knowledge of tea and coffee decrease iron absorption | Pre intervention | Post intervention | **McNemar Test P=.000** |
|---|---|---|---|
| **Know** | **4 (2.1)** | **178(94.2)** | |
| **Don't know** | **185 (97.9)** | **11 (5.8)** | |
| **Total** | **189** | **189** | |

From the above table it is seen that there is more 94.2% know that tea and coffee decrease the iron absorption in study subjects in post intervention period as compared to 14.3 % study subjects in pre intervention period and this difference is found to be statistically significant P value <.05 after applying McNemar test .

**d.Pre and post intervention change in Knowledge of benefits of deworming in anemia**

| Knowledge of benefits of deworming in anemia | Pre intervention | Post intervention | **McNemar Test P=.000** |
|---|---|---|---|
| Know | 4(2.1) | 187(98.9) | |
| Don't know | 185(97.9) | 2(1.1) | |
| Total | 189 | 189 | |

From the above table it is seen that there is more 98.9% study subjects know the benefits of deworming in anemia in post intervention period as compared to 14.3 % study subjects in pre intervention period and this difference is found to be statistically significant P value <.05 after applying McNemar test .

**e.Pre and post intervention change in Knowledge of prevention of anemia**

| Knowledge of prevention of anemia | Pre intervention | Post intervention | **McNemar Test P=.000** |
|---|---|---|---|
| Know | 15(7.9) | 188(99.5) | |
| Don't know | 174(92.1) | 1(0.5) | |
| Total | 189 | 189 | |

From the above table it is seen that there is more 99.5% study subjects have Knowledge of prevention of anemia in post intervention period as compared to 7.9% study subjects in pre intervention period and this difference is found to be statistically significant P value <.05 after applying McNemar test .

**3. Table showing prevalence of anemia in study subjects mentioning clearly pre and post intervention prevalence of anemic children and anemic mothers**

| | Anemic(<11gm%) | Non anemic(>11gm%) |
|---|---|---|
| **Pre-intervention Hb of child** | **61 (32.3%)** | **128(67.7%)** |
| **Post intervention Hb of child** | **22(11.6%)** | **167(88.4%)** |
| **Pre-intervention Hb of mother** | **67(35.4%)** | **122(64.6%)** |
| **Post intervention Hb of mother** | **29(15.3%)** | **160(84.7%)** |

**4. Paired Samples T test Statistics on Pre and post intervention change in HB level of children(study subjects)**

| | Paired Differences | | | | | t | Df | P value |
|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | Lower | Upper | | | |
| Pre intervention hb of child<br>post intervention hb of child | -0.828 | 2.3173 | 0.1686 | -1.1605 | -0.4955 | -4.913 | 188 | 0 |

From the above paired T test table P value is .000 i.e.<.005 so there is statistically significant difference between pre and post interventional Hb levels of children of study subjects supporting the alternate hypothesis that advocacy of mothers can significantly improve the Hb levels of their child.

**5. Paired Samples T test Statistics on Pre and post intervention change in HB level of mother (study subjects)**

| | Paired Differences | | | | | T | Df | P value |
|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | Lower | Upper | | | |
| preHb_mother - postHb_mother | -.71894 | 2.10024 | .15277 | -1.02031 | -.41758 | -4.706 | 188 | .000 |

From the above paired T test table P value is .000 i.e.<.005 so there is statistically significant difference between pre and post interventional Hb levels of study subjects i.e. mothers (having child of 6-59 months) supporting the alternate hypothesis that advocacy of mothers can significantly improve the Hb levels in them.

**6. Paired Samples T test Statistics on Pre and post intervention change in consumption of average number of Iron folic acid supplementation in mother (study subjects)**

| | Paired Differences | | | | | T | Df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | Lower | Upper | | | |
| Pre intervention duration IFA intake post intervention duration IFA intake | 627.5397 | 455.4317 | 33.1278 | 562.1897 | 692.8896 | 18.943 | 188 | .000 |

From the above paired T test table P value is .000 i.e.<.005. so there is statistically significant difference between pre and post interventional average duration of intake of IFA supplementation study subjects.

## DISCUSSION

The Health Ministry of India has been recognizing anemia as a critical public health concern. Since a long time initiatives have been focused on educating women about anemia, its causes, and health implications. Iron Deficiency Anemia (IDA) exacerbates this public health challenge, impacting vulnerable groups especially pregnant women and young children. Such as an initiative was taken in Baramulla district of jammu & Kashmir earlier in 2022 Baramulla administration adopted Anemia Free Baramulla in 2022.[3] Anemia remains a critical public health challenge in India, affecting diverse populations including women, children, and adolescents. Despite efforts through programs like the National Nutritional Anemia Prophylaxis Program (NNAPP), the National Nutritional Anemia Control Programme (NNACP), and the Intensified National Iron Plus Initiative (INIPI), challenges such as poor coverage, inadequate training, and weak supply chains persist.[4] After the launch of AMB strategy, the Iron and Folic Acid (IFA) supplementation coverage between 2017–18 and 2019–20 has increased for all beneficiary groups [pregnant women from 78% to 90%; lactating mothers from 34% to 49%; school going adolescent girls (boys) from 23% to 40% (21% to 42%); out-of-school adolescent girls from 6% to 23%; children 5–9 years from 8% to 3% and children 6–59 months from 7% to 15%. Coverage was relatively low for target groups being served through a multi-departmental convergence mechanism (health and other departments such as education department for schools or women and child development department for Anganwadi centres) than compared to those served by health department alone.[5] Activities in place to control anemia were prophylactic iron and folic acid (IFA) supplementation and deworming to 6-59-month children, adolescents, and pregnant and lactating women. For children five to nine years of age, IFA was not provided in the district, but deworming was done. The coverage of IFA prophylaxis in children 6-59 months was 22.5% and 85.1% in adolescents. The 180-day IFA supplementation in pregnant women was 33.1%. The IFA stock status was not captured in the district. The AMB index for district Faridabad (April 2018 to March 2019) was 35.[2] Gaps in understanding data elements and mismatches between AMB

denominator data and census forecasts limited the data's accuracy.[6] So far these above references of studies shows that there must be a mechanism that is cost effective and can be implemented in rural as well as in urban areas. So this interventional study was planned, this interventional study shows that advocacy of mothers can be an effective tool to combat anemia and making Anemia Mukt Bharat a great success.

## CONCLUSION

This community bases cross sectional study shows that role of advocacy of mothers (having children 6-59 months) is a great tool to improve the haemoglobin levels in both children and mothers. this also shows the role of advocacy in improving better outcomes in other national programmes as well.

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