

## Original Research Article

# Factors influencing the uptake of pulse vitamin A supplementation among children in a rural area in India: a cross sectional study

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## ABSTRACT

**Background:** The change in strategy of India's National Program for the prevention and control of nutritional blindness due to Vitamin A deficiency during 2006, aims for all children aged 9 months to 5 years to receive biannual pulse dose of Vitamin A with a total nine mega doses of Vitamin A. Micronutrient initiative (MI) was providing technical assistance to the State Health department of Karnataka in implementing the new bi-annual strategy, in partnership with UNICEF during the period 2006 to 2010.

**Methods:** During July 2006, the Investigator evaluated its coverage in Gulbarga district. This study assessed the factors influencing the uptake of pulse Vitamin A supplementation (VAS) among children from impoverished background. Using oral questionnaires, a total of 30 Parents (Mothers) of these children, 12 childcare workers (AWWs), 12 peripheral health workers (ANMs) were interviewed regarding barriers towards implementing this Program and assessment of the facilities (12 Anganwadi centres) were conducted.

**Results:** Only 28% of the facility had some IEC display regarding VAS. 75% of ANMs were aware that either green leafy vegetables or fish or fruits are the main source of micronutrients. A similar number of ANMs knew that Vitamin A deficiency causes night blindness, >90% of AWW had informed parents about the program during the monthly mother meetings. <20% of parents were aware of the current pulse VAS program and a similar number were aware of the next round of supplementation.

**Conclusions:** Regular interaction with families, monitoring the activities of field level health workers and supportive supervision will enable uptake of VAS Program. Future action should prioritize sub-district level units – blocks and villages, with higher concentration of poor households.

**Keywords:** Anganwadi center, Bi-annual strategy, Micronutrient deficiency, Micronutrient initiative, Pulse dose, Vitamin A supplementation

## INTRODUCTION

Vitamin A Supplementation (VAS) is one of the most cost-effective mechanisms towards significantly reducing all-cause childhood mortality.<sup>1</sup> The change in strategy of India's National program for the prevention and control

of nutritional blindness due to Vitamin A deficiency during 2006, aims for all children aged 9 months to 5 years to receive biannual pulse dose of Vitamin A with a total nine mega doses of Vitamin A before the child's fifth birthday. Until July 2006, Vitamin A was provided only at routine immunization contact points for children in the age group of 9 months to 36 months in this State of

Karnataka. The 1<sup>st</sup> and 2<sup>nd</sup> dose were linked with Measles vaccination at 9 months and Diphtheria, Pertussis, Tetanus booster at 1 1/2 years respectively were receiving some priority, but the other 3 doses (given six months apart) not coinciding with any other routine PHC contact point being the reason for low coverage. The acute side effects of Vitamin A which is provided in the liquid form include nausea and vomiting.

UNICEF as a part of its REACH (Regular Events to Advance Child Health) strategy opines that the bi-annual approach is an effective way to significantly improve coverage and should be addressed as a child survival tool.<sup>2</sup>

Children (mostly from below poverty line families) in the age group of 3 to <6 years are provided non-formal education in State run Anganwadi centers. The childcare workers (Anganwadi worker: AWW) in these centers foster care for children, mothers, adolescent girls and women in the reproductive age group (15-44 yrs). Children <3 yrs of age stay at home and their healthcare needs are provided by the field level health workers (Auxiliary nurse midwife: ANM) from the sub-centre (sub-component of Primary health centre).

In Countries such as India where micronutrient deficiency remains a public health problem, and while food-based solutions are gradually being implemented to reach such population, administering children two doses of Vitamin A per year when children are between the ages of 9 months and 5 years of age reduces their chance of dying by upto 24% and reduces child blindness by upto 70%<sup>3</sup>.

The International NGO Micronutrient Initiative/Nutrition International (MI) is supporting the Government of India with Vitamin A supplementation programs in States where the under-5 mortality rate is high.<sup>2</sup> MI provides technical and programmatic support to State Governments for maintaining supply chain systems of Vitamin A solution, capacity building and monitoring this new endeavor of biannual delivery of child health and survival intervention. This also involves working with local Non-Governmental organization such as Swami Vivekananda Youth Movement, towards providing technical support at the field level.<sup>4</sup> MI's initiative in this Program includes micro planning, training activities, monitoring, improving reporting systems and coverage evaluation.

The aim of this study was to enlist the facilitators and barriers for the uptake of bi-annual VAS program. The objectives include assessing the listed stakeholders as well as the facilities and suggesting measures for better uptake of the program.

The National Reproductive and Child Health Program is implementing key programs under its broad strategy for

reproductive, maternal, newborn, child and adolescent health, through the following programs:

- Janani Suraksha Yojana (JSY) for pregnant mothers,
- Janani Shishu Suraksha Karyakram (JSSK) for intrapartal care,
- Rashtriya Bal Swasthya Karyakram (RBSK) for children,
- Rashtriya Kishore Swasthya Karyakram (RKSK) for adolescents,
- National Iron-plus Initiative (NIPI) for controlling iron deficiency anaemia,
- Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA).

## METHODS

This Project was initiated in the State of Karnataka during July 2006. The Investigator then was a Post-Graduate student at the Department of Community Medicine, M. R. Medical College, Gulbarga, and evaluated the coverage of VAS in the district of Gulbarga. This study aims to assess the factors influencing the uptake of pulse Vitamin A supplementation among children from impoverished background.

Using pre-validated semi-structured oral questionnaires, a total of 30 Parents (Mothers) of these children, their 12 teachers (AWWs) and 12 peripheral health workers (ANMs) were interviewed regarding barriers to this specific protection measure. Also, an assessment of the facilities (12 anganwadi centres) level factors influencing the same were carried out in the Project.

### *Inclusion criteria*

- Participation on the part of study subjects (Parents of children, Teachers, Health workers) has been optional. Among the many anganwadi centres in the district of Gulbarga, the Investigator could only visit 12 centres during the study period given the geographical location of these centres.

### *Exclusion criteria*

- Any beneficiary unwilling to participate was excluded from the study.

With the onset of this campaign during July 2006, only first dose of Vitamin A is given along with Measles vaccine as part of the routine immunization. The 2<sup>nd</sup> to 9<sup>th</sup> dose are given during bi-annual campaigns which will be held at six monthly intervals. The present study was carried out over a two-week period during the month of July 2006.

The study exercise was carried out separately by the Investigator, by visiting the 12 Anganwadi centres as listed

in (Table 1). The Nurseries (called locally as Anganwadi centres) were personally visited by the Investigator and an observation checklist consisting of 14 questions was used for facility assessment. The AWWs in these centres were interviewed with a questionnaire comprising 13 questions. ANMs were subjected to a questionnaire comprising 23 questions. Parents of these children were subjected to a questionnaire comprising 16 questions.

**Table 1: List of facilities.**

Name of taluk in Gulbarga district	Name of Anganwadi centre
Afzalpur	Gobbur B
Afzalpur	D Ganigapur
Aland	Kadaganchi
Aland	Narona
Gulbarga Urban	Makthampur
Sedam	Malkend
Chincholi	Kodli
Chittapur	Hebbal
Chittapur	Kalgi
Gulbarga Rural	Kamalapur
Gulbarga Urban	Manekeshwari
Sedam	Sedam

**Statistical analysis**

The study design is descriptive cross-sectional in nature. Univariate analysis was computed using Microsoft Excel.

**RESULTS**

Cumulative data from the study are being presented to draw appropriate inference.

**Table 2: Facility assessment.**

Variable assessed	%
Children (1 to <3 yrs) given Vitamin A	86
Children (3 to <6 yrs) given Vitamin A	88
Session conducted separately	90
New Vitamin A bottle opened on the day of visit	35
Adequate Vitamin A for session	92
Adequate Vitamin A for round	80
IEC material displayed at Centre	28
Health staff supporting session	36

As listed in (Table 2), only 28% of the facilities had displayed IEC (information, education, communication) posters regarding the VAS program, 90% of the sessions were conducted in Anganwadis, with only one facility being a makeshift under the tree. 85% of the facilities had maintained a register, and 65% had stored the immunization cards of the children.

Either ANM or AWW was administering Vitamin A to the children in most of the facilities, with only 2 centers

depending on the helper for the same, 65% of the centers were administering Vitamin A with a designated spoon, and the others were either pouring the solution directly or using the lid of the bottle. Except for the assessment parameter of IEC display at the facility (only 28% of the facilities had some display), the other parameters were indicative of successful uptake of the program.

In this study 75% of ANMs were aware that either green leafy vegetables or fish or fruits are the main source of micronutrients. A similar number of ANMs knew that Vitamin A deficiency causes night blindness. However, they were unaware of other systemic manifestations of its deficiency, 75% of ANMs were aware that the first dose of Vitamin A supplementation to children is given with Measles vaccine at 9 months to 1 year of age, 65% of ANMs were trained in VAS program, and half of them were not sure of the dosing and duration of VAS, 50% of ANMs also complained of lack of supply of Vitamin A solution (Table 3).

**Table 3: Knowledge of health staff, parents and teachers regarding VAS.**

Variable assessed	%
ANMs know about biannual round strategies	50
Parents know about VAS	<20
Parents know about immunization card	76
Parents know about next biannual round	9
AWWs aware of current VAS program	90
AWW informed Parents about the program	>90

As depicted in Table 3, <20% of Parents were aware of the current pulse VAS program and a similar number were aware of the next round of supplementation. 50% of the Parents were aware of the source of Vitamin A as either green leafy vegetables or fruits. A similar number were aware of night blindness among children with deficient Vitamin A consumption, 50% of Parents opined that ANMs/AWWs through their house to house visits had conveyed information regarding the VAS program. 35% of Parents were aware that VAS program is beneficial to the eyesight of their children, 50% of Parents were aware of the age group included in the VAS program. However, all the Parents were willing to get Vitamin A administered during the next round as they believed it is beneficial to their children. As mentioned in (Table 3), 90% of AWWs were aware of the current VAS program, and a similar number were aware of the source of Vitamin A as either green leafy vegetables or fruits. Around 90% of AWWs were aware that deficiency causes night blindness, >90% of AWW had informed parents about the program during the monthly mother meetings.

**DISCUSSION**

According to estimates by UNICEF (State of World’s children 2014), global two-dose coverage of preschool age children reached 70% in 2012.<sup>3</sup>

The Investigator observed that the Social welfare department which looks after the functioning of the Anganwadi centers, and the Health department which has distributed the Vitamin A syrups have worked in close coordination to ensure stable procurement and distribution mechanisms. Microplan which includes list of beneficiaries as well as the location of anganwadi centres and the houses, has been effectively documented. There have been intense social mobilization exercises and the staff seemed to have been adequately trained. The success of VAS program has been documented in two other States of India, Bihar and Orissa. The critical factors identified include strong ownership by the State Governments, coordination between the Health and Social welfare departments implementing the Program, effective microplanning prior to each biannual round, stable procurement and distribution mechanism to ensure sustainable supply of VAS, appropriate training and supervision of staff, and intensive social mobilization and communication.<sup>5</sup>

Between 2006 and 2011, the mean full VAS coverage (two VAS doses per child per year) in seven impoverished States of India increased from 44.7% to 67.3%. The number of districts with high ( $\geq 80\%$ ) VAS coverage (full) increased from 9.4% to 51.4%. A 40.3% decrease in the number of poor children (i.e children living in households classified as poor) who did not receive two VAS doses annually was observed (8.5 million in 2006 to 5.1 million in 2011), 49.1% (~2.5 million) of these children lived in the districts with the lowest proportion of poor households.<sup>6</sup>

Global evidence shows that in 1997, Niger was the first African country to effectively integrate VAS into National Immunization day (NID) for polio eradication. The subsequent challenge includes providing children with a second annual dose of VAS. In 1999, National micronutrient day (NMD) was started in Africa. NMDs include mobilization campaigns in which caregivers actively accompany their children for the delivery of VAS. Since 1999, the combination of NIDs and NMDs has ensured that  $>80\%$  of children 6 to 59 months of age receive two doses of VAS annually.<sup>7</sup>

Ayoya M.A et al,'s study conducted at Mali, Indonesia, during 2007 found that atleast 80% of the target children received the supplement.<sup>8</sup> Traditional communication channels (town criers, friends, family members) appeared more effective in reaching the target groups than modern methods (radio, television). The variables study site (urban/rural), traditional channels of communication and Father's education were significantly associated with children's coverage of VAS. Knowledge regarding the Program was high among community, administrative leaders, and health professionals.

Parmar D.V et al,'s study conducted at Gujarat, India during 2006 reports that anganwadi workers were present in only 30% of the centres, 60% of health staff were

aware about biannual round strategy, 23% of Parents were aware of the current round and none of them were aware of the next round.<sup>9</sup> Anganwadi workers were present in  $>90\%$  of the centres, 50% of the ANMs were aware of the current VAS strategies,  $<20\%$  of Parents were aware of the current round and most were unaware of the next round.

In this study, few parents (of  $<3$  yr old children) refused to receive services from ANMs as the health worker belonged to a different caste. The same issue also affected the work of ASHA, which in-turn disrupts effective delivery of counseling services. Such social norms influence the provision of health services in many parts of rural India. Regular discussion with elders and community leaders has paved the way for finding a common ground. Such deliberations have enabled change in perceptions about women and professionals of various castes in these roles. This Program is not being carried out as a standalone campaign but delivered along with a package of health and nutrition services. It has also demonstrated positive impact on several other Programs such as Routine Immunization (RI) and Integrated child development services (ICDS) (school attendance and mid-day meals).

Only women are employed as ASHA, and even ANMs who provide maternal and child health services in the community are women. The Anganwadi centres are run by a teacher (AWW) and worker, who also are women. The mindset of elder generation which disempowers women will undermine their ability to work professionally, and also adversely influence her ability as a homemaker and caregiver. Consequently, the health workers in these communities often carry the burden of an overwhelming demand.

The Investigator also simultaneously chaired the Village health sanitation and nutrition committee's (VHSNC) in each of these 12 villages.<sup>10</sup> This has enabled behavior change communication initiatives towards the uptake of VAS. This also enabled the Investigator for motivating the Pregnant mothers towards delivering in their outreach health centre, where no hospitalization charges accrue and all incentives from Government are provided to the beneficiaries.

During the course of the Project, the Investigator came across Grade I malnourished children in a few Anganwadi centres. However, the Parents of these children were not willing to take their children to the nearest Nutritional Rehabilitation Centre (NRC) for complimentary feeding. In this regard, the Investigator addressed the issue with the in-charge Medical Officer at NRC in the Referral hospital who in-turn guided towards 'Aid-the-ailing' association. This private NGO provides multi-protein food packets to malnourished children, and around 60 food packets were provided to a total of 6 malnourished children in the community.

## CONCLUSION

The uptake of VAS in the anganwadi centre as well as in the community can be increased by display of posters providing information, education and communication messages regarding the same. In India, frontline health workers including Auxillary nurse midwives (ANM) and Accredited social health activists (ASHA) are often the link that women and children have towards basic healthcare. Both ANMs and ASHAs have easy access to mothers and children in their respective communities. Advocacy measures for VAS are being implemented through one-to-one counseling in the households, or by sharing micronutrient related information during Village health sanitation and nutrition days (VHNDs). Also, the staff are addressing Self-help groups (SHGs) which comprise of women from the village, regarding utilization of the available Government nutrition programs.

Parents from BPL (below poverty line) families are aware of the need for supplementary nutritional service for their children and are willing to dissipate their concerns when they witness the benefits of receiving care and support from ANMs, AWWs and ASHAs. Regular interaction with families of pregnant women and young children, monitoring the activities of field level health workers and supportive supervision will enable uptake of VAS Program. In the Indian context, it has been reported that the coverage of Vitamin A supplementation is below par in certain areas including under-served rural areas and urban slums which have sub-optimal health infrastructure. Health program planning should include definitive approaches to reach out to habitat agglomerations concentrated by poor households, especially sub-district level units such as blocks and villages.

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