

# Role of ICDS program in delivery of nutritional services and functional integration between anganwadi and health worker in north India

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## Citation

S Prinja, R Verma, S Lal. *Role of ICDS program in delivery of nutritional services and functional integration between anganwadi and health worker in north India*. The Internet Journal of Nutrition and Wellness. 2007 Volume 5 Number 2.

## Abstract

**Background:** The Integrated Child Development Services ICDS program is poised for universal implementation in India to provide services to children, pregnant and lactating women and adolescent girls in close coordination with the health services for improvement of health status and overall holistic development of children and other beneficiaries. However there remain questions on its effectiveness in delivering desired services.

### Objectives:

To ascertain the nutritional status and dietary patterns of 1-3 year old children in areas served by ICDS program.

To assess the nature and extent of functional integration between the ICDS and health sector.

**Methodology:** A Community based cross sectional study was done from June 2005 to November 2005 in 60 anganwadi centres within 30 "functional" subcentres from 5 community development blocks in district Rohtak selected by stratified random sampling. A total of 408 children between 1-3 years age, mothers of 408 children and 60 anganwadi workers were selected from these anganwadis for the study. All children were weighed to assess the nutritional status using IAP classification of weight for age. Mothers of all children were interviewed to assess dietary patterns and nutritional education imparted by anganwadi workers. 60 anganwadi workers were interviewed to assess the functional integration with Multipurpose health worker [MPHW(F)].

**Results:** The study revealed that 199 (48.7%) children were underweight and 19.8% children had dietary calories intake more than 80% of RDA. Advice regarding breast feeding and complementary feeding was given by anganwadi workers to 179 (43.8%) women only. Involvement of mothers in growth monitoring is very low. The program is well integrated in functioning with the health sector.

**Conclusion:** The problem of under-nutrition continues to persist with low involvement of mother. The program needs to be further revamped with a holistic approach towards child development and making the mother responsible for the health of the child.

## INTRODUCTION

The Integrated Child Development Services (ICDS) program is the world's largest early child development program. It was initiated in 1975, as a small beginning in 33 blocks, in the country<sup>(1)</sup>. Universalization of ICDS was originally contemplated to be achieved by the end of 1995-96, through expansion of services all over the country. However due to

various constraints, a total number of 5068 projects could become operational by the end of ninth Five Year Plan as against an overall 5652 blocks/wards spread all over the country<sup>(2)</sup>.

There is little consensus on the success of the ICDS program in tackling problems of health and nutrition in early

childhood, despite being one of the most studied health and nutrition interventions<sup>(3)</sup>. Within the public health literature, there are many quasi- experimental studies that investigate the effect of ICDS participation on specific health behaviors or conditions. There are many studies, which have reported association of, improved nutritional status with ICDS services<sup>(4,5,6,7)</sup>. Further the ICDS services are reported to be associated with improved immunization status of the under 3-year-old children<sup>(8,9)</sup>.

On the contrary, a study in Delhi revealed that children who attended ICDS in childhood are not at a significantly lower risk of malnutrition than non-participants<sup>(10)</sup>. No significant statistical difference in nutritional status between children living in a block with ICDS services and children living in a block without ICDS services was observed in Madhya Pradesh<sup>(11)</sup>.

However much of the research undertaken is an attempt at evaluating the impact of ICDS program towards reduction in under-nutrition and much of other important areas of behavioural outcomes and integration with health sector are left untouched. The present study was conducted to assess nutritional status and child feeding practices of 1-3 year old children and ascertain the nature and extent of functional integration in planning, service delivery and monitoring and evaluation between ICDS and health.

## **MATERIAL AND METHODS**

### **SETTING**

The study was conducted in district Rohtak which was chosen purposively. Rohtak has a population of 837,903 spread over in six community development blocks of which one is an urban block and five are rural blocks. The study was conducted in rural blocks of Rohtak. Nutritional, health education and preschool educational services are imparted to the beneficiaries by a network of 585 anganwadi centres (AWC) in 24 rural sectors. Under the system of Primary Health Care, Rohtak has 5 Community Health Centres (CHC), 30 Primary Health Centres, and 113 subcentres to provide comprehensive reproductive and child health services to the population at large.

### **STUDY DESIGN AND SAMPLING**

The present cross sectional study was done from June 2005 to November 2005. District Rohtak was purposively chosen. The study covered 10% anganwadi centres from the five rural blocks. A multistage stratified random sampling was

adopted to select the sample. Since the study objective included ascertaining the functional integration of ICDS and health sector; “functional” subcentres, having both male & female multi purpose health workers (MPHW) in position continuously since 1996-97 were considered for the study. Of the 113 subcentres in the district, 41 subcentres met the definition of “functional subcentre”. A 10% sample of anganwadi centres was envisaged to be selected in the district, so 60 anganwadi centres were to be selected from the functional subcentres. In order to have a geographically representative sample of the entire district, 6 functional subcentres from each of five blocks (out of the 41 functional subcentres) were chosen randomly. A list of anganwadi centres within each subcentre was prepared which served as the sampling frame for random selection of 2 anganwadi centres within each subcentre and thus a total of 60 anganwadi centres in the district. Since, the total functional subcentres itself was less than 60 (i.e. 41), it was not possible to select 1 anganwadi centre from each subcentre and the investigators had to resort to 2 anganwadi centres per subcentre. Overall anganwadi centres to be selected was prefixed to be 10% of total i.e. 60 anganwadi centres, hence selection of more anganwadi centres per subcentre would have led to lesser number of subcentre-anganwadi centre pairs for evaluation of functional integration between the health and ICDS program (one of the study objectives) which could have biased the study results. Two anganwadi centres from each of these selected subcentres were thus chosen randomly. Thus the study had a representative sample of 12 anganwadi centres from each community development block and a total of 60 (10.2%) AWCs for the study.

Preschool children (1-3 years) were selected for assessing nutritional status. Considering a population of 32,249 (1-3 year old children), prevalence of severe malnutrition of 5% (worst acceptable result to be 2%) and 95% confidence limits, a sample size of 201 children was worked out. Since this sample was not drawn from the entire district, and anganwadis were selected purposively and stratified over the six blocks, so a design effect of 2 was used to account for any intracluster and intercluster variation with subcentre being taken as cluster. Thus the overall sample of children to be weighed was worked out to be 402. Overall, 408 children were recruited. These children were selected from 60 anganwadis by simple random sampling.

Nutritional status among 1-3 years old children was assessed

by computing weight for age and grading the children using the IAP classification. Children were weighed using salter weighing machines <sup>12</sup>. Association of nutritional status with gender, maternal education, father's occupation and birth order was determined. Dietary intake of protein and calories for 1-3 year old children was determined using the 24-hour dietary recall method from the child's mother at her home. Two more visits were paid by the investigators to the home of the child if the mother was not available during the first visit. Another child was randomly selected from the area if the mother was not available for interview at home even on the third visit. Apart from dietary history, mothers were interviewed using a pre-tested semi-structured interview schedule on breast feeding, complementary feeding practices and nutritional education and counselling imparted by the anganwadi worker to ascertain the effectiveness of health and nutrition education imparted by AWWs. Informed consent was obtained from study participants.

Functional integration in work between anganwadi workers and MPHWF was assessed by interviewing 60 anganwadi workers using a pre-tested semi-structured interview schedule administered by the investigators.

Data was entered in MS-Excel spreadsheet and was analyzed using the Epi Info version-6 (Epi 6) statistical software. Simple proportions were computed to report prevalence of under-nutrition and results of functional integration. Association of under-nutrition with socio-demographic variables was estimated using Odds ratio as the measure of association and 95% confidence intervals were computed for estimating statistical significance. Univariate and bivariate analysis was done.

## RESULTS

The study was conducted in 60 anganwadis from all five rural blocks in district Rohtak. The population covered under the study anganwadis was 80598 with an average <sup>13</sup>43 persons per anganwadi. Non-participation in the study due to non-availability of mother at home even after three visits was 1.2%. There was no denial of consent for mother's interview or weighing of child.

Underweight was found among 199 (48.7%) children with the prevalence of moderate to severe malnutrition (grade II or III) being 15.5%. Underweight among 1-3 year old children was significantly associated with higher birth order (three or more;  $p < 0.001$ ), lower maternal education (primary or less;  $p < 0.001$ ) and father's occupation being labourer

( $p < 0.001$ ) (Table I).

**Figure 1**

Table 1: Prevalence of Underweight and its attributes

Characteristic	Nutritional status				Association (Odds ratio)
	Grade I	Grade II	Grade III	Normal	
Prevalence	136 (33.2)	58 (14.3)	5 (1.2)	209 (51.3)	
Sex					2.03 (1.3-3.08)
Female	64 (41.7)	42 (22.4)	3 (1.6)	78 (41.7)	
Male	72 (32.6)	16 (7.2)	2 (0.9)	131 (59.3)	
Maternal education					Reference
≥Secondary	18 (37.5)	2 (4.2)	0	28 (58.3)	
Matric	32 (28.3)	13 (11.5)	3 (2.7)	68 (60.2)	0.93
Middle	34 (31.8)	9 (8.4)	2 (1.9)	62 (57.9)	1.02
Primary	39 (35.5)	26 (23.6)	0	42 (38.2)	2.27
Illiterate	13 (43.3)	8 (26.7)	0	9 (30)	3.27
Father occupation					Reference
Self employed	24 (30.4)	8 (10.1)	0	47 (59.5)	
Govt. employed	4 (18.2)	1 (4.5)	0	17 (77.3)	0.43
Private employed	46 (30.3)	13 (14.6)	0	87 (56.1)	1.15
Labourer	62 (40.8)	26 (17.1)	5 (3.5)	59 (38.8)	2.32
Birth order					Reference
First	21 (25.4)	3 (25.4)	0	82 (71.9)	
Second	40 (29.9)	21 (2.7)	0	73 (54.4)	2.14
Third	61 (43.9)	26 (18.7)	3 (2.1)	49 (35.3)	4.71
≥Fourth	6 (28.6)	8 (38.1)	2 (9.5)	5 (23.8)	8.20

Only 81 (19.8%) and 41 (10.1%) children among 1-3 year old had calories and protein intake respectively more than 80% of recommended dietary intake (RDA). Malnourished children were found to be significantly associated with dietary intake of protein ( $p = 0.005$ ) and calories ( $p < 0.001$ ) less than 70% of RDA (Table II).

**Figure 2**

Table 2: Dietary intake among 1-3 year old children

Dietary intake	Percent of recommended dietary allowance (RDA)					Association (95% CI)
	≥80	70-80	60-70	50-60	<50	
Calories						
Malnourished	34 (17.1)	21 (10.5)	68 (34.2)	29 (14.6)	47 (23.6)	2.18 *(1.4-3.3)
Normal	47 (22.5)	48 (23)	61 (29.2)	35 (16.7)	18 (8.6)	
Overall	81 (19.8)	69 (16.9)	129 (31.6)	64 (15.7)	65 (16)	
Protein						
Malnourished	12 (6)	18 (9)	45 (22.6)	52 (26.2)	72 (36.2)	1.96* (1.16-3.33)
Normal	29 (13.9)	26 (12.4)	67 (32.1)	41 (19.6)	46 (22)	
Overall	41 (10.1)	41 (10.1)	112 (27.4)	93 (22.8)	121 (29)	

\* represents OR for calories/protein intake <70% RDA among malnourished compared to normal children.

Breast feeding was initiated by 68 (16.7%) mothers within one hour of the child birth and 163 (39.9%) mothers had started semisolid complementary feeding within 6-9 months age. Exclusive breast feeding (till six months age) was done by 115 (28.2%) women. This estimate of exclusive breast feeding includes administration of customary pre-lactal feed to child only once after birth, which was observed to be

a universal practice. Advice regarding initiation of breast feeding and exclusive breast feeding was given by AWW to 179 (43.8%) mothers while importance of timely initiation of complementary feeding and the types of food to be given was discussed with 139 (34.1%) mothers. Awareness regarding the current weight of the child was found among 288 (70.5%) mothers, however knowledge about the nutritional status in terms of growth chart was evident among 12 (2.9%) mothers only. The study observed that 341 (83.6%) children took away the supplementary nutrition provided at anganwadi centre, and 318 (77.9%) children shared it with other family members and older siblings.

**Figure 3**

Table 3: Functional integration between anganwadi worker and MPHWF

Characteristic	Anganwadi workers (%)
<b>Number of contacts with MPHWF (last one month)</b>	
1	0
2	6 (10)
3	17 (28.3)
4	18 (30)
≥5	19 (31.7)
<b>Help provided by AWW to MPHWF</b>	
Identification and registration of ANC	60 (100)
Identification and registration of births and deaths	60 (100)
Beneficiary enlistment and social mobilization in routine immunization	60 (100)
Social mobilization in IPPI	60 (100)
Identification of family planning cases	31 (51.7)
Functions as drug distribution centre at AWC	10 (16.7)
Functions as depot holder for contraceptives	9 (15)
Identify low birth weight children	1 (1.7)
<b>Exchange of health information (every month)</b>	
Antenatal	60 (100)
Birth	60 (100)
Postnatal	12 (20)
Immunization	60 (100)
Vitamin A supplementation	27 (45)
IFA tablets	41 (68.3)
Contraceptives	35 (52.3)
<b>Joint performance of</b>	
Household survey	17 (28.3)
MSS meeting	45 (75)
Sector meeting	54 (90)
Planning of work schedule	0

Fifty four (90%) anganwadi workers had met the MPHWF thrice or more during the past one month. Health information related to antenatal, birth and immunization was exchanged by all (60) anganwadi workers with their respective MPHWF. However, information on postnatal care and vitamin A was exchanged by 12(20%) and 41 (68.3%) anganwadi workers respectively. Information on contraception was shared between 35 (52.3%) AWWs and their MPHWF (Table III).

Annual household survey was performed jointly with the MPHWF by 17(28.3%) anganwadi workers while MSS meeting was held in coordination and active participation of MPHWF in 45 (75%) anganwadi centres. None of the

anganwadi workers planned their work schedule jointly in coordination with the MPHWF barring the organization of the weekly immunization session (Table III).

All the anganwadi workers helped the MPHWF in identification and registration of ANC cases, registration of births and deaths, enlistment of beneficiaries for the routine immunization and social mobilization during special immunization activities like national or sub-national pulse polio immunization days. Nine (15%) and 10 (16.7%) anganwadi centres functioned as depot holders for contraceptives and drug distribution centres respectively. The help provided by MPHWF to AWW included predominantly provision of health education to the women beneficiaries (47, 78.3%); providing basic medicines including iron folic acid tablets, oral rehydration solution, contraceptives, paracetamol and antimalarial drugs for presumptive treatment (33, 55%); and identification and referral of severely malnourished children (16, 26.7%).

## DISCUSSION

The present study which was conducted in district Rohtak assesses the role of ICDS program in provision of nutritional services to preschool children. Underweight continues to be major problem among the 1-3 year old preschool children (48.7%). The findings are comparable to other recent studies<sup>(13,14,15)</sup>. Dietary intake of calories and protein is more than 80% of RDA among 19.8% and 10.1% children respectively. Thus the anaganwadi workers have failed on account of bringing about a change in the feeding of children at home.

Majority of studies have focussed on assessment of the long term impact i.e. anthropometric measurement and important intermediate outcomes are not assessed<sup>45,6,77</sup>. However the present study reveals that the ICDS program has not achieved any major success in improving behavioural outcomes such as timely initiation of breast feeding (16.7%) and complementary feeding (39.9%). Prevalence of exclusive breast feeding has remained low at 28.2%. The authors acknowledge the presence of numerous other factors including socio-economic conditions, socio-cultural beliefs and literacy status which determines child feeding practices however low proportion of women who reported to have been advised by the anganwadi worker regarding breast feeding and complementary feeding reflects the deficiency of the program. The focus of the ICDS scheme is improvement of the nutritional status of children employing a holistic approach, a major focus of which is nutritional

education and counseling. However, the study revealed that this component is starkly missing in service provision with only 139 (34.1%) mothers being advised on complementary feeding.

Involvement of mothers in growth monitoring is an integral component of the activity, which however has been reduced to a mere routine of weight recording with only 12 (2.9%) mothers having knowledge of nutritional status of their child in terms of the growth chart.

The anganwadi workers work in close coordination with the health workers with frequent contacts and regular exchange of health information. The health workers and the AWWs function as a team and help each other in their routine working. However functional integration in planning of joint work schedule needs strengthening. The study found that none of the AWW planned her work schedule jointly with the MPHWF except for the immunization sessions which serve as the regular meeting forums for the AWW and MPHWF. It was encouraging to observe that 54 (90%) AWWs jointly attended the sector meetings with the MPHWF. These are platforms for exchange of information and should be used for continuing education of the AWWs.

Overall, the study observes that the ICDS program serves as an excellent platform for many development initiatives in the country and delivers services right at the doorstep of the beneficiaries to make it more accessible. The program is well integrated with the health system, which should be taken a step further in integration of infrastructure, planning of daily work and monitoring. However despite having a holistic approach towards child development, the major operational weaknesses of the program include inadequate emphasis on nutritional and health education activities for behaviour change and lack of active participation of the family particularly the mother for the health and nutrition of the child. The involvement of mothers in growth monitoring should be enhanced by introduction of simplified growth charts which are kept with the family. Family and the mother need to be made more accountable for the health of the child.

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