



*International Journal Of*  
**Recent Scientific  
Research**

ISSN: 0976-3031  
Volume: 7(4) April -2016

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THE OFFICIAL PUBLICATION OF  
INTERNATIONAL JOURNAL OF RECENT SCIENTIFIC RESEARCH (IJRSR)  
<http://www.recentscientific.com/> [recentscientific@gmail.com](mailto:recentscientific@gmail.com)



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

International Journal of Recent Scientific Research  
Vol. 7, Issue, 4, pp. 10472-10478, April, 2016

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## Research Article

### A FIELD TRIAL TO IMPROVE THE PRACTICES OF ANGANWADI WORKERS RELATED TO GROWTH MONITORING

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#### ARTICLE INFO

##### Article History:

Received 05<sup>th</sup> January, 2016  
Received in revised form 21<sup>st</sup>  
February, 2016  
Accepted 06<sup>th</sup> March, 2016  
Published online 28<sup>th</sup>  
April, 2016

##### Keywords:

Anganwadi Worker, Practice,  
Logistics, Growth monitoring

#### ABSTRACT

**Introduction:** Regular Growth monitoring can aid in early detection and appropriate actions for growth faltering. It is therefore important that regular practices pertaining to Growth Monitoring is done, which will lead to improved skills of the AWWs. Efficacy in practices is also affected with the availability and functionality of logistics related to Growth Monitoring at the AWC.

**Objectives:** 1. To assess the improvement in practices related to growth monitoring by Anganwadi workers after the planned intervention.  
2. To assess the effect of availability and Functionality of logistics on the practices related to Growth monitoring by AWWs

**Methodology:** It was a field based interventional study, which was conducted on 66 AWWs each from Chirgaon (intervention) and Chhapra (control) community development blocks of Varanasi district. AWWs were interviewed with the help of a predesigned and pretested interview schedule. Availability and functionality of logistics at the Anganwadi Centers were verified and practices related to Growth Monitoring by AWWs were cross examined during Village health and Nutrition day.

**Results:** Practicing correct methods for 'date of birth' confirmation was significantly ( $p < 0.05$ ) improved post intervention. The proportion of respondents practicing complete filling of the growth chart increased from less than 50% to 72.7% in intervention block during endline ( $p < 0.05$ ). The uses of equipments (weighing machines, infantometer etc.) were higher in proportions as compared to their availability and functionality.

**Conclusion:** Intervention was found effective in improving the practices of AWWs in regard with growth monitoring and availability and functionality of logistic support required for growth monitoring was found affecting their related practices.

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## INTRODUCTION

Malnutrition is still persistent in developing countries. The World Bank has stated malnutrition as India's silent emergency (Singh B, 2013). Malnutrition among children thus continues to plague the developing countries like India. Directly contributing to a third of the under 5 mortality (Malnutrition, WHO 2016). Regular Growth monitoring is the way to aid for early detection and appropriate actions for growth faltering (Growth Monitoring Manual, NIPCCD, 2010). The task of Growth Monitoring is widely undertaken by the ICDS in India with Anganwadi Workers (AWWs) as its important functionary. To fulfill the objectives of growth monitoring, proper practices by Anganwadi workers supported by appropriate knowledge and skill is of utmost important.

Therefore an intervention was planned to improve the practices of AWWs related to growth monitoring through building their capacity in terms of knowledge and skills related to growth monitoring.

However, following the proper practices also depends on the availability and functionality of logistics at Anganwadi centers, as this is one of the common problems faced by AWWs in practicing their duties related to growth monitoring. It plays a confounding factor in the correctness of growth assessment. The present study has also tried to determine the effects of availability and functionality of logistics on practices of an Anganwadi workers related to Growth Monitoring.

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## Objectives

1. To assess the improvement in practices related to growth monitoring by Anganwadi workers after the planned intervention.
2. To assess the effect of availability and Functionality of logistics on the practices related to Growth monitoring by AWWs

## METHODS

**Type and place of study:** This was a field based Intervention study, which was conducted in Varanasi district of Uttar Pradesh state in India. The intervention group of AWWs was selected from Chiraigaon community development block of Varanasi district, while control group was chosen from the nearby block (Cholapur), considering the similar socio demographic milieu.

**Period of study:** This article is part of a thesis entitled "Use and Interpretation of Growth Chart among health workers: An Interventional study in rural areas of Varanasi district". The study was conducted for a period of 5 years (October 2010 to September 2015).

**Sample size:** Skill of AWWs regarding correct plotting and interpretation of growth charts was considered as the factor to determine the sample size for the study. Not much of Interventional based study has been undertaken in India since the introduction of New WHO Growth Chart 2006 and its implementation by ICDS. So, a pilot study was conducted on 40 Anganwadi Workers in Chiraigaon Community Development Block, which showed a prevalence rate of 8.5% of correct skill for plotting and interpretation of growth charts among Anganwadi Workers. A difference of 20% was estimated between the two groups (intervention and control) after intervention. Considering this prevalence, the sample size for this study was calculated using the formula:  $n = 2(Z_{\alpha} + Z_{\beta})^2 (P_1 Q_1 + P_2 Q_2) / (P_1 - P_2)^2$ . Where, n= Sample size,  $z_{\alpha} = 1.64$  (one sided),  $Z_{\alpha} = 1.64$  at 5% level of significance,  $Z_{\beta} = 1.28$  at 90% power,  $P_1 =$  Proportion of study subjects having correct skill for plotting and interpreting growth chart. (0.08),  $P_2 =$  Proportion of correct skill after intervention in the study group (0.28),  $Q_1 = 1 - P_1 = 0.92$ ,  $Q_2 = 1 - P_2 = 0.72$  and  $P_1 - P_2 = 20\%$ . The required sample size calculated was  $n = 117.3 = 118$  (for both intervention and control group). Thus, sample size for each group was 59. Also, 10% potential attrition (non-participation rate) was considered ( $100/90 * 118 = 131.1 = 132$ ) post intervention. Thus the final sample size for each group was 66.

**Sampling Methodology:** Two stages were involved in the selection of study subjects. In the first stage, one Community Development Block (i.e. Chiraigaon) was selected from eight Community Development Blocks of Varanasi District by non probability purposive sampling. Cholapur community development block is geographically adjacent to chiraigaon community development block; as such it was taken as the area for control group after matching the socio-demographic variables. A quick survey was conducted before the baseline data collection to prepare the sampling frame and for group matching of selected AWWs based on all known socio-demographic, work and training related variables.

In the second stage selection of villages to be included in interventional and control group was done. Chiraigaon community development block has 232 Anganwadi Centres comprising of 232 Anganwadi Worker. Out of these 232 AWW 66 AWW were selected from 66 AWC of 66 different villages through simple random sampling method at both stages (village selection and AWC selection). During sample selection, the AWWs, who were included in pilot testing, were excluded from the sampling frame. Cholapur Community Development Block has 200 Anganwadi Worker. The similar method was applied in selecting the samples for control group.

**Tools and Technique:** A pre-designed and pretested interview schedule was used to assess the practices of AWWs related to growth monitoring. Practices related to completeness of growth chart filling and maintaining complete and accurate growth monitoring register were also assessed. Last 2 months growth charts were reviewed at AWCs to assess the completeness of their filling/plotting. The accuracy of filled growth monitoring registers were assessed by cross checking the entered values with at least two randomly selected growth charts out of available filled growth charts from last two months. Their affirmed practices were cross examined during Village health and Nutrition day (VHND). The availability and functionality of logistics (growth charts, infantometer, child and adult weighing machines, salter scale etc.) at the Anganwadi Centers were verified personally. All study subjects were interviewed in local language. Privacy was maintained at the time of interview.

The intervention given to AWWs was in the form of training sessions of in a group of 3-4 Anganwadi workers per session. Handouts were also provided to them which were formulated in Hindi language for feasibility in understanding along with better retention of the training. The training was imparted in local language. Average duration of the whole training session was 2 hours (including 30 minutes practical exercise).

**Data analysis:** Data generated was analyzed with the help of Microsoft excel 2007 and SPSS v.16.0 software. Appropriate tables were generated and chi-square test has been applied to draw relevant inferences.

## RESULTS

**Group matching of selected AWWs from intervention and control blocks:** Nearly half of the AWWs were in age group of 30-39 years in both intervention and control blocks. Almost all the respondents in the study area were Hindus. Majority of respondents in Chiraigaon were belonging to OBC caste category, while in Cholapur it was in other caste category ( $p > 0.05$ ). More than 90 percent of the respondents in both the blocks were currently married. Majority of the respondents in both the blocks were living in a joint family and more than half of the AWWs were having more than 10 members in their families. More than 95% of the respondents in both the blocks were residing in the same village where their AWC is located. Nearly half of the AWWs in both the blocks were educated up to graduation level or above and near about two third of the AWWs' husband were educated up to graduation level and above. Majority of the AWWs' husbands were govt. or private employees. Majority of respondents' family in both the blocks

prevail lower middle class followed by middle and lower class as per BG Prasad classification.<sup>10</sup> Near about one fourth of the families of the AWWs were surviving Below Poverty Line (BPL) as per the Government laid criteria of census 2011. Majority of the AWWs in both the blocks were having 5 to 10 years of work experience as anganwadi. Almost all the respondents in both the intervention and control group had received at least one training after joining as AWW and near about two third of AWWs had received at least one refresher training during their job. There was no significant difference ( $p > 0.05$ ) in regard with all the socio-demographic, work and training related variables between intervention and control block.

**Practice of Anganwadi Workers related to growth monitoring:** Near about 85% of the AWWs in both the blocks were using immunization card of the child to confirm the date of birth of a child. This practice could be significantly ( $p=0.048$ ) improved among up to 97% of AWWs post intervention in intervention block. Around one fourth of the AWWs in both the blocks were using birth certificate as document to verify the age of child. Intervention could also improve this practice among more than 50% of AWWs in Chiraigaon block, while it was constant in Cholanpur ( $p=0.013$ ). As evident from analysis of socio demographic variables that majority of AWWs were residing in the same village in which AWC was located. Thus majority of AWWs (nearly 90%) in both the blocks invariably during baseline and endline were usually aware about the exact delivery date of the child through personal contacts and they were not following any age verification method. During baseline survey a small fraction of respondents ranging between 7-11 percent in both the blocks was found to be using national events calendar for verifying the correct age of the child. This practice was found increased (53.0%) significantly ( $p < 0.01$ ) during endline survey in intervention block as compared to control block.

Regular growth chart plotting and interpretation through growth curves was the prevalent method of growth monitoring for children in the study area, which was being followed by all the AWWs invariably pre and post intervention. During baseline survey, only around one third of AWWs in both the blocks were doing clinical assessments of children to assess their growth. This practice was found improved to 70% during endline in intervention block, while it was constant in Cholanpur ( $p < 0.01$ ).

During the baseline survey more than 90% of respondents in both the blocks (Intervention group- 95.5% and Control group- 93.9%) practiced measuring weight of a severely malnourished child 3 times a month. This practice was statistically similar ( $p > 0.05$ ) in both the blocks. This practice of weight measurement after knowledge and skill up-gradation training in chiraigaon block was observed to be changed to four times a month among majority (95.5%) of them. Not much change in the proportion was found in the control. Post intervention this difference in weight monitoring practice in both the blocks was found to be statistically significant ( $p < 0.01$ ). Majority of respondents in both intervention block (56%) and non-intervention block (62%) during baseline survey could not respond regarding the necessary action to be taken for a case of severely malnourished child. This difference in proportion between intervention and control blocks was not statistically significant ( $p > 0.05$ ). Majority (92.4%) of the AWWs in Chiraigaon block after intervention responded that they were referring such cases to hospital as the necessary preventive actions, but the situation was similar in control block. Thus showing a significant ( $p < 0.001$ ) difference in practices between both the blocks post intervention.

AWWs were asked about their advices, which they usually give to the mother/ caregiver to retain/improve the health status of their child.

**Table 1** Practice of Anganwadi Workers related to growth monitoring

	Baseline			p value/ Fishers exact	Endline			p value/ Fishers exact		
	Chiraigaon (n=66)		Cholanpur (n=66)		Chiraigaon (n=66)		Cholanpur (n=66)			
	N	%	N	%	N	%	N	%		
<b>Methods of DOB confirmation</b>										
Immunization card	57	86.4	56	84.8	0.804	64	97.0	58	87.9	<b>0.048</b>
Birth Certificate	19	28.8	17	25.8	0.696	34	51.5	20	30.3	<b>0.013</b>
Knows the delivery date of the mother	63	95.5	59	89.4	0.188	59	89.4	60	90.9	0.770
Correlate with National events	7	10.6	5	7.6	0.545	35	53.0	7	10.6	<b>&lt;0.01</b>
<b>How AWWs observe that growth is taking place in a desired way</b>										
By regular growth chart plotting	66	100.0	66	100.0		66	100.0	66	100.0	
Interpretation through growth curve	66	100.0	66	100.0		66	100.0	66	100.0	
By clinical assessment	23	34.8	24	36.4	0.856	46	69.7	26	39.4	<b>&lt;0.01</b>
<b>Frequency of weight measurement of severely malnourished children (per month)</b>										
3 times	63	95.5	62	93.9	0.50	3	4.5	58	87.9	<b>&lt;0.01</b>
4 times	3	4.5	4	6.1		63	95.5	8	12.1	
<b>Refer to Hospital</b>										
Yes	29	43.9	25	37.9	0.479	61	92.4	29	43.9	<b>&lt;0.01</b>
Not commented	37	56.1	41	62.1		5	7.6	37	56.1	
<b>For a healthy child advice give to their mother to retain their health status</b>										
Continue with the same diet	25	37.9	23	34.8	0.717	44	66.7	26	39.4	<b>0.002</b>
Nothing	41	62.1	43	65.2		22	33.3	40	60.6	
<b>For a malnourished child advice give to their mother to improve their health</b>										
Counselling as per training module	25	37.9	27	40.9	0.722	34	51.5	29	43.9	0.384
Home remedies	44	66.7	49	74.2	0.340	59	89.4	46	69.7	<b>0.005</b>
Refer to doctor	34	51.5	33	50.0	0.862	61	92.4	36	54.5	<b>&lt;0.01</b>

Around two third of the AWWs in both the blocks were not advising anything to the mothers/ caregivers of healthy children, and only around one third were advising to continue with the same diet to retain the health of the child. These proportions were reversed in Chiraigaon after intervention and two third of the AWWs were advising to continue with the same diet to retain the health of the child. In Choolapur the similar kind of practice was observed as baseline. And post intervention, this difference in practice between intervention and control block was statistically significant ( $p=0.002$ ). In case of malnourished child nearly 40 percent of respondents in both the blocks were counseling the mother/ caregiver of the child, nearly  $2/3^{\text{rd}}$  in intervention block and nearly  $3/4^{\text{th}}$  in control block were advising for home remedies, and 50 percent of the AWWs in both the blocks were referring to hospital for prompt medical advice from the doctor. After intervention, during endline survey around 50 percent of respondents in Intervention block were counseling mothers/ caregivers as per the training module ( $p >0.05$ ), 90% of AWWs were advising for home remedies ( $p=0.005$ ) and 92.4% were referring malnourished children to hospital for prompt medical advice from the doctor ( $p <0.01$ ). (Table 1)

**Practice of AWWs related to completeness of growth charts filling:** During baseline survey it was found that less than 50% of AWWs in both the blocks had completely filled the growth chart during baseline survey. This proportion was increased to 72.7% in intervention block during endline, while it was only 50% in control taluk. Thus showing a significant ( $p= 0.007$ ) improvement in practice of filling or plotting growth chart by respondents in Chiraigaon after intervention. Majority of respondents, except 2AWWs in Chiraigaon and 1 AWW in Choolapur were having growth monitoring register at their respective Anganwadi Centers or their home. Post intervention all 66 AWWs were having growth registers in Chiraigaon block. Around 90% of AWWs in both the blocks, out of those who were having growth registers, practiced maintaining complete growth monitoring register during baseline survey. This figure was found around 95% during endline in both the blocks. Around 70% of AWWs in both the blocks, out of those who were having growth registers, practiced maintaining accurate filling of growth monitoring register during baseline survey. This figure was found 80.3% during endline in intervention block, while in control block the practice was found unchanged. This difference was not statistically significant. (Table 2)

**Availability and functionality of the tools / instruments present with the respondents vis-à-vis their practices of use for Growth Monitoring:** More than 80 percent of the respondents in both the blocks were using growth chart for growth monitoring, and this proportion was 93.9% and 86.4% in Chiraigaon and Choolapur post intervention ( $p >0.05$ ). Although blank growth charts were available only at 71.2% and 75.8% of AWCs during baseline and 84.8% and 83.3% of AWCs during endline in Chiraigaon and Choolapur, respectively. To clear this discrepancy between the proportions of availability and use of growth charts, researcher further observed that many AWWs were reusing the filled growth charts for new child due to lack/uninterrupted of supply of blank growth charts. A monthly progress report (MPR) is submitted by the respondents to their respective supervisor's which is further submitted by the supervisor to District office. This MPR contains only the no. of healthy, underweight, overweight and malnourished children in the respondent's respective Anganwadi Center without any attachment of filled growth charts or anganwadi registers. Thus the filled up growth chart and growth monitoring register is no where monitored and cross examined at higher level. During baseline survey it was found that only near about 55 percent of respondents were having new growth charts based on WHO growth chart 2006. This proportion was increase up to nearly 90% in both the blocks during endline. This proportion could be increased due to government supply of new cards at AWCs in last 1 year.

During baseline survey nearly 70 percent of respondents in both the blocks were using Infantometer for weight measurement as a tool for growth monitoring. This proportion was found to be significantly ( $p=0.002$ ) increased up to 94% in the Intervention block during endline survey, while not much of a difference was found in the utilization of Infantometer in the control group (74.2%). Nearly 90 percent of respondents in both the blocks were using child weighing machine for weight measurement of children invariably during baseline and endline.

Again the difference was found between uses and availability of functional infantometer (around 40% in both the blocks during baseline as well as endline) and child weighing machine (85%-90% in both the blocks during baseline as well as endline) at AWC. It was cleared by researcher by further observation and discussion with AWWs.

Table 2 Practice related to completeness of growth charts filling

Variables	Baseline				p value/ Fishers exact	Endline				
	Chiraigaon		Choolapur			Chiraigaon		Choolapur		p value/ Fishers exact
	N	%	N	%	N	%	N	%		
<b>Complete filling/plotting of the Growth charts (from last 2 months filled graphs)</b>										
Yes	30	45.5	29	43.9	0.861	48	72.7	33	50.0	0.007
No	36	54.5	37	56.1		18	27.3	33	50.0	
Total	66	100.0	66	100.0		66	100.0	66	100.0	
<b>Growth monitoring register available at AWC or home of AWW</b>										
Yes	64	97.0	65	98.5	1.000	66	100.0	65	98.5	1.000
No	2	3.0	1	1.5		0	0.0	1	1.5	
<b>Growth monitoring register*</b>										
Complete	56	87.5	59	90.8	0.551	62	93.9	62	95.4	1.000
Accurate	46	71.9	48	73.8	0.801	53	80.3	46	70.8	0.204

\*Proportion has been calculated out of those who were having growth registers



It was found that AWWs were borrowing infantometer and child weighing machines from their nearby AWCs or their friend AWWs for the use, in case if their own center's equipment is nonfunctional or unavailable. That's why the proportion of use of infantometer and child weighing machine was more as compared to the proportion of availability of functional equipment. Around two third of AWWs were having functional adult weighing machines at their centers invariably during baseline as well as endline survey. The use of adult weighing machine was exactly in accordance with the availability of functional equipment. Less than 10 percent of respondents in both the blocks during both baseline and endline survey were using salter scale which was in accordance with the availability at AWC. None of the Anganwadi Worker was using Uniscale or Bar scale for weight measurement of children and either of it was not present also at any anganwadi center. (Table 3)

calendar for verifying the correct age of the child. This practice of documents verification and correlating with national events by AWWs could be significantly improved post intervention in intervention block. Majority of AWWs (nearly 90%) were usually aware about the exact delivery date of the child through personal contacts and so unfortunately they were not following any age verification method.

Regular growth chart plotting and interpretation through growth curves was the prevalent method of growth monitoring for children in the study area, which was being followed by all the AWWs invariably pre and post intervention and only around one third of AWWs were doing clinical assessments of children to assess their growth. While in a study [Manhas and Dogra \(2012\)](#) found that only one fourth of the studied of AWWs were assessing the nutritional status of child through growth chart while 40% were doing the same by checking only weight every month.

**Table 3** Availability and functionality of the tools / instruments present with the respondents vis-à-vis their practices of use for Growth Monitoring (n=66)

Variables	Baseline					Endline				
	Chiraigaon		Cholapur		p value/ Fishers	Chiraigaon		Cholapur		p value/ Fishers
	N	%	N	%		N	%	N	%	
Using growth chart	54	81.8	55	83.3	0.819	62	93.9	57	86.4	0.144
Blank Growth chart available at AWC	47	71.2	50	75.8	0.554	56	84.8	55	83.3	0.812
Type of Growth Chart (blank) available at AWC*	28	59.6	26	52.0	0.453	49	87.5	49	89.1	0.794
	19	40.4	24	48.0		7	12.5	6	10.9	
Using infantometer	45	68.2	48	72.7	0.567	62	93.9	49	74.2	<b>0.002</b>
Functional infantometer present	24	36.4	25	37.9	0.857	30	45.5	28	42.4	0.726
Using child weighing machine	59	89.4	60	90.9	0.770	60	90.9	59	89.4	0.770
Functional child weighing machine present	60	90.9	57	86.4	0.411	58	87.9	54	81.8	0.332
Using adult weighing machine	42	63.6	46	69.7	0.460	44	66.7	45	68.2	0.853
Functional adult weighing machine present	44	66.7	46	69.7	0.709	44	66.7	48	72.7	0.449
Using salter scale	4	6.1	5	7.6	0.500	5	7.6	6	9.1	0.753
Functional salter scale present	4	6.1	5	7.6	0.500	5	7.6	6	9.1	0.753

\*None of the Anganwadi Worker was using uniscale nor was it present at any anganwadi center

**Duration of non functionality of weighing machines:** Child weighing machine was non-functional in 6 AWCs in Chiraigaon and 9 AWCs in Cholapur since last on an average  $13.50 \pm 6.50$  (range 6-24) months and  $16.22 \pm 9.563$  (range 6-36) months, respectively. The situation was even worse at endline and it was found that none of the machine got repaired or newly supplied during last 1 year, so 8 and 12 child weighing machines were non-functional in Chiraigaon and Cholapur, respectively. Similarly in around 20 AWCs adult weighing machines were non functional since last on an average 2 years. The situation was almost similar at endline. (Table 4)

During baseline survey it was found that all the AWWs were maintaining the growth charts but less than half of them had completely filled the growth chart during baseline survey. This proportion was increased to around three fourth in intervention block during endline, while it was same in control block. Thus showing a significant ( $p=0.007$ ) improvement in practice of filling or plotting growth chart by respondents in Chiraigaon after intervention. Sharma and Jain (2014) also highlighted the 100% practice of maintain the growth chart in AWC by all the AWW.

**Table 4** Duration of non functionality of weighing machines present with respondents in AWC

Group	Variables	Baseline		Endline	
		Chiraigaon	Cholapur	Chiraigaon	Cholapur
Duration of child weighing machine being non functional	N	6	9	8	12
	Mean ± SD	13.50±6.50	16.22±9.563	24.25±13.242	27.08±14.841
	Range	18(6-24)	30(6-36)	40(8-48)	40(8-48)
Duration of adult weighing machine being non functional	N	22	20	22	18
	Mean ± SD	24.27±9.53	25.80±9.753	34.50±10.787	38.67±9.701
	Range	24(12-36)	24(12-36)	39(9-48)	24(24-48)

## DISCUSSION

In the present study near about 85% of the AWWs were using immunization card and around one fourth were using birth certificate as documents to verify the age of child. A small fraction of respondents were also using national events

Majority (more than 90%) of the AWWs in the study area were practicing measuring weight of a severely malnourished child 3 times a month which was changed to four times a month among majority (95.5%) of them after knowledge and skill up-gradation training in chiraigaon block. [Desai G et al., 2012](#) observed that AWWs were regularly measuring weight of all

children every month and every 15 days for grade 2-3 malnourish children. In the study of [Thakare MM et al., 2011](#), all the AWWs were weighing children at monthly frequency for 0-3 yr and at once in 3 months for 3-6 yrs age group. In the study of [Karkar and Sharma \(2013\)](#), 81% AWWs recommended weighing child every month and 14% AWWs recommended fortnightly. A record review at AWCs by [Kapil U et al., 1996](#) indicated that the weights of only 60% of children were being recorded regularly by AWWs.

More than half of AWWs during baseline survey could not respond regarding the necessary action to be taken for a case of severely malnourished child. After intervention majority (92.4%) of the AWWs in Chiraigaon block responded that they were referring such cases to hospital as the necessary preventive actions. Referral services for severely malnourished children by AWWs were also not satisfactory in the studies of [Parmar A et al., 2014](#), [Manhas S et al., 2012](#) and [Chudasama RK et al., 2015](#). But [Madhavi LH and Singh HKG \(2009\)](#) observed in their study that 86.7% AWWs were having better knowledge about the referral services. [Desai G et al., 2012](#) observed that all the AWWs were working in liaison with Auxiliary Nurse Midwife and referring the cases of grade 2-3 malnourished children to primary health centre.

Around two third of the AWWs in both the blocks were not advising anything to the mothers/ caregivers of 'healthy' children, and only around one third were advising to continue with the same diet to retain the health of the child. These proportions were reversed in Chiraigaon after intervention and two third of the AWWs were advising to continue with the same diet to retain the health of the child. In case of 'malnourished' child less than half of the respondents in both the blocks were counseling the mother/ caregiver of the child, nearly 2/3<sup>rd</sup> were advising for home remedies, and 50 percent of the AWWs were referring to hospital for prompt medical advice from the doctor. These practices could be significantly improved after intervention. Practice of informing parents about the child's nutritional status and health and nutritional education to them was also lacking among AWWs in the study conducted by [Parmar A et al., 2014](#), [Sharma and Jain \(2014\)](#) and [Gurukartick J et al., 2013](#). A study by [Daxini and Kanani \(2008\)](#) in rural AWCs of Vadodara showed that, although the AWWs were aware of the objectives of growth monitoring, this service was reduced to merely an exercise in taking and recording the children's weight, and the mothers were not given education on child's nutrition status. In the study of [Manhas and Dogra \(2012\)](#), fifteen per cent of AWWs stated that they have to maintain the growth charts for the purpose of reporting child's growth to parents.

Almost all the AWWs were having growth monitoring register at their respective Anganwadi Centers or their home and out of them majority (around 90%) practiced maintaining complete growth monitoring register and around 70% practiced maintaining accurate filling of growth monitoring register. These practices could be improved significantly post intervention. In the study by [Jena P \(2013\)](#), all the AWWs mentioned that all the records and registers need to maintain. [Manhas S et al., 2012](#) also observed that around two third of AWWs were having weight register and growth chart registers at their centers. But this finding is contrary to the findings of

[Thakare MM et al., 2011](#), which showed that only around one fourth of the studied AWWs were having malnutrition register and growth card registers at their centers.

More than 80 percent of the respondents in both the blocks were using growth chart for growth monitoring. The proportion of use of growth charts was exceeding the proportion of availability (around 70%) because of reuse of the filled growth charts for new child by AWWs due to lack/uninterrupted of supply of blank growth charts. These findings are lesser than the findings of studies by [Thakare MM et al., 2011](#) and [Kapil U et al., 1996](#), which reported the availability of growth charts at 78.6% and 83.3% of anganwadi centers, respectively in last six months.

Nearly 70 percent of AWWs were using Infantometer and near about 90% were using child weighing machine for weight measurement of children. Again the difference in proportions of use and availability of both kinds of equipments was found because AWWs were borrowing them from their nearby AWCs or their friend AWWs for the use, in case if their own center's equipment is nonfunctional or unavailable. But [Parmar A et al., 2014](#) observed that new born weighing scale was present at all AWCs. [Manzoor and Khurshid \(2014\)](#) had inferred in their study that 70% of the workers were feeling hindrance in the day to day functioning due to lack of adequate provision of facilities, while 30% workers were managing things as they were.

Only around two third of AWWs were having functional adult weighing machines at their centers in this study. [Thakare MM et al., 2011](#) found that functional weighing machines were available in 85.7% of AWCs. [Malik A et al., 2015](#) also observed that weighing machine was present in 70.7% of the AWCs. But [Parmar A et al., 2014](#) found that adult weighing scale were present at all AWCs. [Kapil U et al., 1996](#) inferred in their study that 75% of AWWs were unable to use weighing scales properly. Less than 10 percent of AWWs in the present study were using Salter scale which was in accordance with the availability at AWC. In the study by [Parmar A et al., 2014](#), Salter weighing scale was present among 69% of respondents. None of the Anganwadi Worker was using Uniscale or Bar scale for weight measurement of children and neither of it was present also at any anganwadi center. Child weighing machine was non-functional in 6 AWCs in Chiraigaon and 9 AWCs in Choolapur since last on an average 15 months and in around 20 AWCs adult weighing machines were non functional since last on an average 2 years.

Blank growth charts were available only at around three fourth of AWCs. And out of those only near about half of respondents were having new growth charts based on WHO growth chart 2006. This proportion was increase up to nearly 90% in both the blocks during endline. This proportion could be increased due to government supply of new cards at AWCs in last 1 year. [Malik A et al., 2015](#) also observed that growth charts for growth monitoring of children were present in 68.3% of AWCs.

These kinds of infrastructure and logistic supply related issues responsible for various problems faced by the AWWs in their job have been demonstrated by many other studies ([Patil and Doibale 2013](#), [Madhavi & Singh 2009](#), [Baba HA 2013](#), [Parmar](#)

M et al., 2015, Sandhyarani & Rao 2013, Gurukartick J et al., 2013).

## CONCLUSION

Based on the findings of the study, it can be concluded that intervention was found effective in improving the practices of AWWs in regard with growth monitoring like; correct method of DOB verification of child, determine that growth is taking place in a desired way, frequency of weight measurement of severely malnourished child, advice for mothers/caretakers of children if the child is malnourished or healthy and completeness in filling the growth charts. However availability and functionality of logistic support required for growth monitoring was found affecting their related practices.

## Recommendation

1. A regular training and supportive supervision of the Anganwadi workers is recommended to up-grade the knowledge and skill of AWWs, as knowledge and skill up- gradation related to growth monitoring plays an important role in improving the practices of AWWs pertaining to Growth Monitoring.
2. Availability and functionality of adequate logistics directly affects the practices of the AWWs. It is therefore necessary to ensure availability of adequate and functional tools/equipments among the AWWs.

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