



## Blended Training for Frontline Health Functionaries: Is this the Way Ahead?

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### ABSTRACT

**Background:** To test the change in the knowledge of the study participants following a Blended Training and Learning Approach (BTLA). Secondly, the paper also tries to discuss the use of this method over the classical classroom based trainings. Frontline health functionaries are the backbone of almost all health goals. It is therefore essential to ensure proper training of this cadre of workers for optimum service delivery. The present paper tries to discuss the use of an effective new training pedagogy over the classical classroom based trainings.

**Methods:** A cross-sectional study was conducted from August 2013 to April 2014 in all districts in the state of Odisha. The study participants comprised of two groups. Group 1: Integrated Child Development Services supervisors, Child Development Project Officers received training on reduction of stunting. Group 2: Nutrition Counselors and Auxiliary Nurses and Midwives received training on management of severe acute malnutrition (SAM). Selection of participants was done following complete enumeration technique. The training effectiveness was measured using paired *t*-test. Out of approximately 2400 participants identified across the state of Odisha, 2350 participants provided consent to participate in the study.

**Results:** The change in knowledge was determined by using paired *t*-test. The results of the paired *t*-test for the training on reduction of stunting were significant,  $P < 0.001$ , indicates that there was a significant increase in the score from (mean = 11.4; standard deviation [SD] = 2.34) to the post-test (mean = 13.8; SD = 2.34). The mean increase was 2.4 with 95% confidence interval [CI] for the difference between means of 11.4 and 13.8. Similar test was conducted to evaluate the training on SAM. The results of the paired *t*-test were significant,  $P < 0.001$ , indicates that there was a significant increase in the score from (mean = 14.7; SD = 2.8) to the post-test (mean = 15.8; SD = 2.3). The mean increase was 1.12 with 95% CI for the difference between means of mean = 14.7 to mean = 15.8. There are different approaches that can be adapted during any training ranging from the traditional form of classroom teaching to the new technologically advanced forms of training such as e-learning. Understanding the merits and demerits, there was the felt need to try a newer approach of training. Thus, the method of BTLA was tried in the study and was proved to be effective.

**Conclusions:** The newly tried and tested pedagogy of training would provide the necessary evidence for future policy decisions.

**Keywords:** Blended training, frontline functionaries, severe acute malnutrition, stunting

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### INTRODUCTION

Under-nutrition is responsible for more than one-third of child deaths globally,<sup>[1]</sup> and it is more prevalent in low and lower-middle-income countries.<sup>[2]</sup> Poverty has remained an important underlying cause of poor nutrition status among children in these lower-middle-income countries.<sup>[3,4]</sup> It has been cited as a factor behind food

insecurity,<sup>[5,6]</sup> low maternal education, poor access to healthcare,<sup>[7]</sup> and burden of diseases,<sup>[8]</sup> each of which mediates poor child nutrition status. The National Family Health Survey (NFHS 3) data show that 53% of children in rural areas are underweight and this varies across states in India. The percentage of underweight children in the country was 53.4 in 1992; it decreased to 45.8 in 1998 and rose again to 47 in 2006. According to the Global Hunger Index (GHI) report for the year 2012, India ranked 15<sup>th</sup> among the countries facing the hunger situation. It is sad to witness that the GHI also shot up from 22.9 to 23.7 between the year 1996 and 2011. Under-nutrition status as per Economic survey of Orissa 2010–11, however continues to be high, 40.7% of children below 3 years are underweight (weight for age), 45% stunted (height for their age) and 19.5% are wasted (weight for their height). The state-level data mark the disparity within the districts/populations. District-level Household Survey on reproductive and child health (2002–2004) shows the level of under-nutrition is higher in the districts with predominantly tribal population. The NFHS III (2005–06) data also shows that the level of under-nutrition is higher among the tribal population. According to state tribal health report card 54.4% of children below 3 years are underweight (weight for age), 57.2% stunted (height for their age) and 27.6% are wasted (weight for their height).<sup>[9]</sup>

Mitigating the huge challenges of under-nutrition in India and states like Odisha, Integrated Child Development Services (ICDS) was launched in the year 1974 by the Government of India. ICDS scheme represents one of the world's largest and most unique programs for early childhood development. The program is being implemented through a cadre of anganwadi workers (AWW), supervisors, Child Development Project Officers (CDPOs) and district program officers as ICDS missionary at the district level. The ICDS supervisors and CDPOs are the key functionaries for the effective implementation of ICDS program, run through AWWs who are frontline health and nutrition functionaries (FHF's).

Poor child feeding practices are caused by a myriad of factors. They are associated with cultural factors that may create local tendencies toward selection of low quality complementary foods,<sup>[10,11]</sup> taboos,<sup>[11]</sup> and restrictive traditional beliefs.<sup>[12]</sup> Social factors including caregivers' poor knowledge on nutrition and lack of knowledge on food diversity may correlate with poor feeding practices.<sup>[13]</sup> Such factors may result in low dietary diversity, low feeding frequency, and low food and energy intake for children. Such dietary deficiencies may result in wasting (low weight for height) in children. In order to address the issue, facility based management of severe acute malnutrition (SAM) is being advocated

through Nutrition Rehabilitation Centres (NRCs) under State Health and Family Welfare, Government of Odisha and support by United Nations Children's Fund. The Nutrition Counselor (NC) and Auxiliary Nurses and Midwives (ANMs) also working as FHF's are deputed to NRCs.

Available evidence supports that nutrition training of health workers can improve feeding practices and thus creating a dent in the issue of under-nutrition. Previous randomized controlled trials have found higher levels of nutrition knowledge and counseling behavior among health workers who received nutrition training.<sup>[14-16]</sup> Nutrition education to FHF's, addresses tradition-based misconceptions by improving their understanding on nutrition.<sup>[13]</sup> Nutrition training also improved FHF's knowledge in food preparation<sup>[17,18]</sup> and healthy feeding behaviors.<sup>[19]</sup> There are evidences to demonstrate that nutrition training for health workers has yielded varied impacts on child health, particularly regarding nutrition status. Previous systematic reviews have evaluated the impact of nutrition counseling, maternal nutrition education,<sup>[20]</sup> and complementary feeding on children's nutrition status.<sup>[21]</sup>

As the knowledge and skills of the FHF's who work with the community is of paramount, it becomes even more vital that they receive adequate quality training, which can enhance their understanding and skills. Traditionally, the method of teaching that has been followed is classroom based trainings (CBTs), where an instructor would lead the CBTs. Over the years, CBTs have proven to be having certain advantages and disadvantages. CBTs are believed to generate more focus among the participants as they have fewer distractions compared with the e-learning programs. It allows one to train participants in a safe, quiet, clean environment, away from the noise and pressures of the work and home. The classroom environment provides the important "human touch," which is often missing in technology-based training. Group interaction enhances learning and participants learn from one another as well as from the trainer. The group setting also teaches participants how to interact with one another in a professional, productive, cooperative way, which is something that other forms of training often do not provide.<sup>[22]</sup> Teaching in a classroom environment opens up opportunities for trainers to do more with their lesson plans. Even though instructor led classroom teaching has its own benefits, it also has its downside as well.<sup>[23]</sup> Classroom teaching is completely based on the quality of the instructor. Effective learning in a classroom depends on the teacher's ability to maintain the interest that brought the students to the course in the first place.<sup>[23]</sup> The interactions and discussions between the trainer and the participants can be hindered by misunderstanding each other due to the differences of personal values, expectations, attitudes

and beliefs.<sup>[23]</sup> While the classroom environment is quiet, safe, and conducive to focused learning, it is conducted on a predecided venue and time. Another important factor that governs the effectiveness and performance of participants is the batch size. There has been significant relationship established between smaller batch size and higher performance in a classroom teaching.<sup>[24]</sup> This is mainly because it is humanly difficult for a single trainer to be able to reach out to a larger batch size, thereby maintaining a uniform level of interaction with them is challenging. Undertaking trainings, which demands for reaching to a large number of participants spread over large geographies, in relatively shorter time span with expected quality (standardization) is challenging in CBTs. That is where e-learning approach comes to play.

E-learning comes at a time of great transformation in how individuals and organizations learn and transfer learning into performance-in their field. It generates the same quality, maintains uniformity and has minimum information spill over. Learning is a continuous process and should not limit by the end of training.<sup>[25]</sup> Leveraging the power of emerging teaching and learning technologies, strong lessons can be delivered and learnt.<sup>[26]</sup> Ability to standardize the content when technical messages need to be spread to a larger audience without much flaws makes e-learning approach popular. However, methods of e-learning lack connect with the participants.<sup>[27]</sup> E-learning might be challenging in catering to different learning objectives from learners to learners when compared to training in traditional classrooms.<sup>[28]</sup> It is difficult to build a personal relationship with an instructor or other program participants using e-learning, but it happens all the time with face to face training. Hence, e-learning approach of training can be seen as a complement and extension of classical forms of CBTs.

In order to create a comprehensive approach in the trainings, a blend of instructor led CBTs as well as e-learning could be fruitful,<sup>[27]</sup> which can use the benefits of both e-learning and traditional learning in classrooms thereby bridging the gap between the two approaches. This paper tries to look into the pedagogy and effectiveness of one such innovative approach of training, named as Blended Training and Learning Approach (BTLA). The study was undertaken across all the 30 districts of Odisha, India to assess the pedagogy and effectiveness with 2350 subjects. The study was conducted as part of a larger project which aimed at reduction of stunting and facility based management of children with Severe and Acute Malnutrition through capacity building of FHF's and Health Mangers. There are limited studies focusing on pedagogy and its importance in training. Hence, it was a felt need to come up with an innovative approach such as BTLA. The expected outcome of the study has potential to influence future decisions of policy makers by providing an appropriate

and alternate pedagogy of capacity building, not just in the state of Odisha, but also relevant for other lower and middle income countries (LMIC). The present study aimed to test the change in the knowledge of the study participants on reduction of Stunting and management of SAM following a BTLA. Secondly, the paper also tries to discuss the use of this method over the classical CBTs.

## METHODS

### Study design and participants

A cross-sectional study was conducted from August 2013 to April 2014 in all districts in the state of Odisha. The total participants were broadly classified into two groups. One group was trained on the reduction of stunting, and another group was trained on the management of SAM.

Group 1: ICDS supervisors, CDPOs received training on the reduction of stunting. Group 2: NCs and ANMs received training on management of SAM. Selection of participants was done following complete enumeration technique.

Out of approximately 2400 participants identified across the state of Odisha, 2350 participants provided consent to participate in the study. A total of 2208 ICDS supervisors and CDPOs were trained and evaluated using BTLA in 55 batches. In addition, a total of 142 NCs and ANMs associated with NRCs were also trained and evaluated on protocols of facility-based management of SAM using similar techniques.

Seven different training modules were developed, focusing on nutrition specific and sensitive interventions to address stunting. The modules developed were in the areas of: Basics of Nutrition, Water and Sanitation, Infant and Young Child Feeding practices, Social and Behavior Change Communication and Monitoring and Evaluation. The modules were developed in English and then translated to Odia, by language experts. These modules were developed using audio-visual techniques into e-learning format. The contents were reviewed by a panel of experts from different agencies, which were later pilot tested.

In order to measure the pedagogy and effectiveness, a pool of researchers were identified and trained on using BTLA techniques and measuring its effectiveness. The e-learning based audio-visual aids along with CBT techniques were used throughout the study. The technique was incorporated while training the participants in batches at their respective districts. The e-learning module was played during the training, which had all the required technical information for the participants. The researchers played the role of a guide during the trainings. The sessions were paused whenever required as per the need of the participants and the researcher. The researcher facilitated discussions on important topics

during the training based on the information presented in the e-learning modules. Few demonstrations were also used to enhance the understanding of subjects on various topics. The change in knowledge by use of BTLA on the participants was evaluated using pre- and post-test. The purpose of the pretest, was to assess the baseline knowledge of the participants and posttest to gauge the change in knowledge by using BTLA.

### Study tool

The pre- and post-test questionnaire had a total of 20 questions from all seven modules. Both the pre- and post-test questionnaires had similar set of questions. The questionnaire devised was pilot tested in three randomly selected districts of Odisha. The correct responses to the test items in the questionnaire were given one mark, with a maximum of 20 marks. The subjects were divided on the basis of their pre- and post-test scores into “very good” (if the subject secured  $\geq 18$ ), “good” (15-17) “average” (12-14) and “below average” ( $\leq 11$ ). The pre- and post-answer sets were evaluated, marked, and compared.

### Statistical analysis

The Statistical Package for Social Science (SPSS, SPSS Version 20.0, Armonk, NY: IBM Corp.) 20.0 version was used for statistical purposes, and the statistical test of significance was looked at using paired *t*-test.

### Ethical consideration and confidentiality

The study was approved by the Institutional Ethics Committee of Indian Institute of Public Health, Bhubaneswar. The confidentiality of the participants was maintained at all times. The questionnaires were number coded thereby keeping the identity of the patients anonymous. Verbal consent was obtained from each of the participants.

## RESULTS

### Training of Integrated Child Development Services supervisors and Child Development Project Officers

The study covered 2208 ICDS supervisors and CDPOs across 30 districts of Odisha. The trainings were completed in a total of 55 batches across the state. The average batch size for the trainings was 40.

Figure 1 shows that prior to the training, 51.5% participants had scored below average marks, which narrowed down to 15.8% posttraining. A significant increase was seen in the group who scored good marks. A total of 7.5% participants were in the good score category prior to the training, which increased remarkably to 37.7% posttraining. A total of 3% participants were in the very good score category posttraining, which was only 0.5% prior to the training.

### Training of Auxiliary Nurses and Midwives and Nutrition Counselors

Figure 2 shows changes in the percentage of participants in each group pre- and post-training focusing on reduction of SAM. It can be clearly noted that there has been a marked change seen in the scores of pre- and post-training. The graph depicts that prior to the training 13.4% participants scored below average marks, which reduced to 3.5% posttraining. A total of 50% participants were in the good score category prior to the training, which increased to 60% posttraining. A total of 15.4% participants were in the very good score category posttraining which was 12.6% prior to the training.

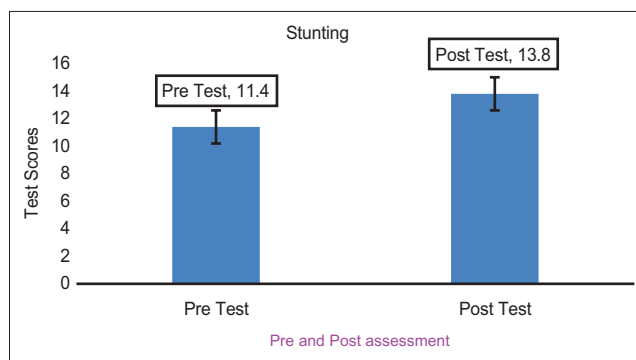
Table 1 shows the paired sample *t*-test conducted to evaluate whether a statistically significant difference existed between the mean training scores before and after the training program. The results of the paired *t*-test for the training on reduction of stunting were significant,  $P < 0.001$ , indicates that there was a significant increase in the score from (mean = 11.4; standard deviation [SD] = 2.34) to the posttest (mean = 13.8; SD = 2.34). The mean increase was 2.4 with 95% confidence interval [CI] for the difference between means of 11.4 and 13.8.

A similar test was conducted to evaluate the training on SAM. The results of the paired *t*-test were significant,  $P < 0.001$ , indicates that there was a significant increase in the score from (mean = 14.7; SD = 2.8) to the posttest (mean = 15.8; SD = 2.3). The mean increase was 1.12 with 95% CI for the difference between means of mean = 14.7 to mean = 15.

**Table 1: The paired sample *t*-test result**

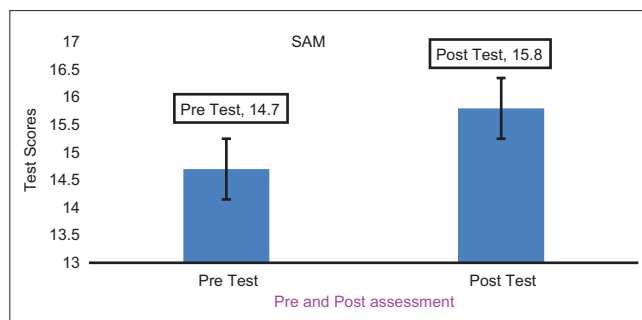
Type of training	Test	Mean	SD	P
Stunting	Pretest	11.4	2.34	0.000
	Posttest	13.8	2.34	
SAM	Pretest	14.7	2.8	0.000
	Posttest	15.8	2.3	

SAM=Severe acute malnutrition, SD=Standard deviation



**Figure 1: Pre- and post-test assessment scores for the training focusing on stunting: Training of Child Development Project Officers and Integrated Child Development Services supervisors**





**Figure 2: Frequency of pre- and post-test assessment scores for the training focusing on severe acute malnutrition: Training of Auxiliary Nurses and Midwives and Nutrition Counselors**

Since we used BLTA technique as the only training method in the study, the change in the knowledge was attributed to the same.

## DISCUSSION

The FHF's play a major role in facilitating the delivery of a wide array of services to the community. In order to ensure quality service delivery, knowledge and skill of staff play a vital role. The study reported that there was a lack of knowledge on the reduction of stunting and management of SAM. There was a significant change that was seen in the pre- and post-test knowledge evaluation scores ( $P < 0.05$ ) in the study. In the present study, more than 50% participants had a below average score prior to the training. Similar findings have been reported among other health care personnel by other studies.<sup>[29-31]</sup> Capacity building of the FHF's is therefore paramount. Previous evidence suggests that capacity building can bring about change in knowledge and skills.<sup>[15,17,18]</sup> There are not many studies which have looked at the importance of various methods/pedagogy in improving the knowledge and skill of FHF's. Understanding the limitation of both CBTs and e-learning there was a need for a new form of guided training. Therefore, this study tried to measure the effectiveness of newly tried innovative method of blending CBT and e-learning approach.

Traditionally, the method of training that has been followed has been the instructor led classroom training.<sup>[15]</sup> There is evidence to show that instructor led trainings are said to generate more focus among the participants as they have fewer distractions compared to the e-learning programs.<sup>[22,32]</sup> A trainer can adapt to the tone and mood of the classroom as per the need, whereas e-learning program may not be able to do the same. It is virtually impossible to build a personal relationship with an instructor or other program participants using e-learning, which is possible in face to face instructor led training.<sup>[22]</sup> Even though instructor led classroom teaching has its own benefits, it also has its downside as classroom based teaching is completely based on the

quality of the instructor, but there are inherent challenges with standardized information dissemination. There are chances of CBTs to be very instructor specific and largely influenced by the behavior of the participants as well as the trainer.<sup>[32]</sup> The trainer's role becomes more yielding when he/she can interact with the participants rather than disseminating information. BTLA was used to impart trainings to its full potential by utilizing the advantages of both instructor led classroom training as well as the e-learning methods thereby bringing advantages of both the teaching methods. There was a significant increase in the level of knowledge in the pre- and post-evaluation scores of the participants, which could be attributed to BTLA. The number of participants in the below average category in the pre-test was reduced to less than half, in the post-test. The significant difference in the level of knowledge in case of pre- and post-test clearly justifies the effectiveness of the improved pedagogy.

The blended learning gives trainer ample opportunities to interact with the participants. The participants as well as the trainer have the liberty of pause, repeat, discuss or omit topics in the e-learning as per the need and requirement. It leads to a focused and quality driven method of training. The project yielded positive results by use of such a technique. By following the technique of blended learning a significant increase in the scores of participant was seen in the posttest scores. The blended learning also changed the way trainers train, offering them effective ways to reach different types of learners and assess participants understanding through multiple means. It also enhanced the relationship between the trainer and participant. With e-learning is effectively integrated into trainings, trainers grew into roles of adviser, content expert, and coach rather than just imparting or disseminating information. It helped trainings more meaningful and fun.

It was understood in the due course of the project that blended learning could be an effective means of training the FHF's. But, it was equally important to acknowledge the current best practices and adapt new techniques. There are countless trainers/instructors who are masters at their craft, currently employing an array of exceptional instructional strategies. Lauding and building upon these strategies along with a mix of e-learning is critical to effective growth in this sector in order to bridge the aforementioned divide.<sup>[26]</sup> This study advocates for an evolution in training practices and approaches to instruction, which not only align with the processes and operations of the world outside of a geographical location of a participant, but also leverage the emerging power and potential of these new approaches of teaching and learning. The blend of personal teaching and technology relationship has the additional benefit of helping to shape emerging technologies that is most effective for cognition and instruction.<sup>[28,32]</sup>

There is felt the need of innovative techniques like BTLA in the government to help broaden the skills of existing professionals and the reach of those who live in geographically isolated areas thereby reducing costs of learning-related travel. In the face of a health worker shortfall, the advantage of BTLA is that health workers from remote locations do not need to leave their post for training so that they can broaden their skills whilst continuing to provide crucial services to their communities. BTLA has the advantage of consuming less time as e-learning techniques, when compared with traditional CBTs. The most important use of the blended learning is its reach. It is one of the effective ways to reach out to a wide array of the population in a short duration to impart the desired information.

This study provides the necessary evidence to influence and guide future policy decisions in training vast majority of frontline functionaries not just in the state of Odisha, India but also across similar geographical settings, including LMIC.

### Limitations

The effectiveness of BTLA was measured using a pre- and post-knowledge assessment of subjects. Better understanding of BTLA pedagogy could have been established by comparing the three methods independently (CBTs, E-learning, and BTLA), which was beyond the scope of the study. It could also be interesting to do multivariate analysis to avoid confusion or biases.

### CONCLUSIONS

There are different approaches that can be adapted during any training ranging from the traditional form of classroom teaching to the new technologically advanced forms of training such as e-learning. Understanding the merits and demerits, there was the felt need to try a newer approach of training. Thus, the method of BTLA was tried in the study and was proved to be effective. The improvement in the test scores of the participants along with a statistical test of significance showing a significant change in the knowledge of the participants can be credited to the use of BTLA. The newly tried and tested pedagogy of training would provide the necessary evidence for future policy decisions.

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