

# TRAINING OF NON-PROFESSIONAL HEALTH WORKERS IN A SIMPLE TECHNIQUE OF DEVELOPMENTAL SCREENING OF INFANTS AND YOUNG CHILDREN

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## ABSTRACT

*Twenty Anganwadi Workers were trained for developmental screening of infants and young children (6 weeks to 2 yrs) and their results compared with that of a trained medical practitioner. The screening tool used was the Woodside System of screening. A reference test (Gesell's Developmental Schedules) was given to 56.5% of the sample. The tester/tester reliability worked out on 50% of the testers was comparable. The results of the tester/author reliability worked out on 150 children were statistically comparable. A high level of proficiency of the workers was retained throughout the study through constant supervision and cross check by the author. The successful training of insufficiently used paramedical manpower for decreasing cost of medical care and improving utilization of the health delivery system is highlighted.*

**Key words:** Developmental screening, Gesell's Developmental schedules, Nonprofessional health workers, Woodside Screening Test, Paramedical workers.

It is estimated that at least one in every ten children in the world is born with or acquires physical, mental or sensory disability. Three quarters of them are in the developing countries and are after further handicapped by poverty. Programs for early detection and timely intervention of disabling diseases are, therefore, vital. Early identification of impairment does not necessarily require high level technical skills. Since busy medical practitioners lack the time required for early detection of deviations from normal, the concept of screening gains importance(1). The required expertise can be imparted through short term training of nonprofessional health workers at a lower cost. The administration of developmental screening tests by such pre-trained workers may enable routine developmental screening to be taken to the door step of the poor(2).

This paper presents an attempt at training nonprofessional workers in the art of developmental screening of children below 2 years using a simple screening technique. Their results have been evaluated and compared with those of a trained medical practitioner. The Woodside Screening Test (WSST) was used as the screening tool(3,4). The reference test employed was the Gesell's Developmental Schedules (GDS)(5).

## Material and Methods

In this cross sectional study, 619 children were assessed by 20 pretrained non-professional workers (Anganwadi workers

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of the local ICDS project) using the WSST. Their results were validated against that of the author who used both the WSST and the GDS to verify the results. The details of sampling, methods of examination, evaluation and analysis of the results are discussed in detail elsewhere(6).

The ICDS program officer and 4 Child Development Project Officers (CDPOs) were approached and the feasibility of the proposed study discussed. The CDPOs were sensitized to the importance and concept of developmental screening of children, especially infants. With the co-operation of the program officer, administrative difficulties were sorted out.

Twenty five Anganwadi workers and their supervisors were invited to an informal meeting. The general concept of screening and the importance of developmental screening of infants and young children was explained to them carefully and their roles in the proposed plan outlined in detail.

After orientation, demonstrations were held in the afternoons twice a week for 4 weeks. During these sessions, generally lasting 4 hours, the exact method of administering the WSST at all key ages was explained, doubts cleared and questions answered. Hindi translations of the proforma and handouts of the Woodside manual(4) readable at primary to middle school level containing the details of the methods of administration and interpretation of the test items were distributed.

The workers were then asked to practise the skills demonstrated using the Hindi handout in their Balwadis. Only after the workers felt confident about their skills were they asked to screen 150 children (6 children each). These children were rescreened by the author within 3 days. Since on statistical analysis of the results,

gross errors in the implementation of the test were discovered an intense retraining program was scheduled to improve the level of proficiency in the administration and interpretation of the test items. The workers were remotivated and again given a demonstration of the WSST. They were persuaded to assess 15 children daily in the author's presence for a period of 2 weeks, during which their difficulties were constantly sorted out and queries answered patiently. All details of the test items were laboriously explained. The sessions lasting for 5-6 hours were conducted in the afternoons. At the end of the 2 week period all the 25 workers were asked to screen a total of 150 children. These children were rescreened by the author within 3 days. The results now obtained were highly satisfactory with statistically insignificant differences in the observations between the worker and the author. Five workers were dropped because their level of proficiency did not improve despite the intensive training. The worker/worker dependability was worked out in 50% of workers (10 out of 20) and the results found to be comparable. With this high level of proficiency the workers were asked to start screening.

## Results

After intensive retraining, the difference in the observation between the author and the workers was statistically insignificant (*Table I*).

On comparing, the observations of the paramedical workers with the author's (*Table I*), it is obvious that the performance of the workers improved remarkably in all the fields after intensive retraining and the difference in the observation of the workers and the author was insignificant.

Similar observation was made when the

TABLE I—Comparative Observations of Screening by 25 Field Workers and the Author Before and After Two Weeks Intensive Training

Field of development	Motor				Adaptive				Language				Personal social			
	Initial screen		After intensive training		Initial screen		After intensive training		Initial screen		After intensive training		Initial screen		After intensive training	
	Worker	Author	Worker	Author	Worker	Author	Worker	Author	Worker	Author	Worker	Author	Worker	Author	Worker	Author
Score code*	Worker	Author	Worker	Author	Worker	Author	Worker	Author	Worker	Author	Worker	Author	Worker	Author	Worker	Author
N <sup>+</sup>	25	40	39	25	30	30	30	30	25	40	42	40	20	31	30	31
N	75	89	98	100	76	98	91	98	75	89	80	89	58	82	73	82
N <sup>-</sup>	30	16	2220	23	27	39	18	23	30	16	20	16	50	27	33	27
AB	20	5	2	2	10	11	4	6	20	5	8	5	22	10	14	10
Total	150	150	1501	150	150	150	150	150	150	150	150	150	150	150	150	150

$\chi^2 = 17.84$   $\chi^2 = 1.66$   $\chi^2 = 17.85$   $\chi^2 = 1.81$   $\chi^2 = 14.45$   $\chi^2 = 1.078$   $\chi^2 = 17.84$   $\chi^2 = 0.68$   
 p value = <0.05 p value = >0.05 p value = <0.05 p value = >0.05 p value = <0.05 p value = >0.05 p value = <0.05 p value = >0.05

N<sup>+</sup>: Above Normal; N: Normal; N<sup>-</sup>: Border line; AB: Abnormal.

results of 10 field workers were compared with each other (*Table II*), i.e., the tester/tester reliability was satisfactory (*Table II*) ( $p > 0.05$  at all times). The comparison of the worker/author observations at 5 key

ages are shown in *Table III*. Again the difference between the two observations was statistically insignificant ( $p > 0.05$  in all instances).

The percentage of abnormal children

**TABLE II**—Comparison of Developmental Assessment of 10 Field Workers in the 4 Fields of Development Assessed by the WSST. (Total Number of Children Evaluated by Each Worker was 50)

Score Code*	Motor		Adaptive		Language		Personal Social	
	A	A1	A	A1	A	A1	A	A1
N <sup>+</sup>	8	9	5	5	7	9	6	5
N	30	28	28	30	30	33	32	33
N <sup>-</sup>	10	11	15	14	11	5	11	11
AB	2	2	2	1	2	3	1	1
	B	B1	B	B1	B	B1	B	B1
N <sup>+</sup>	8	9	6	8	3	3	4	6
N	28	25	30	26	33	30	38	33
N <sup>-</sup>	12	14	9	11	12	14	7	9
AB	2	2	5	5	2	3	1	2
	C	C1	C	C1	C	C1	C	C1
N <sup>+</sup>	7	8	4	6	6	8	4	3
N	31	29	29	29	31	34	34	35
N <sup>-</sup>	9	10	14	13	10	5	10	10
AB	3	3	3	2	3	3	2	2
	D	D1	D	D1	D	D1	D	D1
N <sup>+</sup>	6	7	7	7	4	4	5	7
N	30	27	29	27	32	29	37	32
N <sup>-</sup>	11	12	8	10	11	13	6	10
AB	3	4	6	6	3	4	2	1
	E	E1	E	E1	E	E1	E	E1
N <sup>+</sup>	6	7	3	4	5	7	3	4
N	32	31	30	31	32	35	35	34
N <sup>-</sup>	10	10	13	12	9	4	9	9
AB	2	2	4	3	4	4	3	3

\* N<sup>+</sup>: Above Normal; N: Normal; N<sup>-</sup>: Borderline; AB: Abnormal.

reported by these trained workers varied between 16 and 19% in the four major fields of development, while borderline cases were between 28.74 and 31.6% and normal cases between 49 and 55%. Fig. 1 shows the percentile sheet used by the Woodside Health Centre for recording motor behavior. A Hindi translation was used in the study for assessing development. Fig. 2 shows pictorially the difference in scoring by using the WSST and the standard GDS at the key age 40 weeks in the 4 major areas of development. The sensitivity, specificity, under and over referral rates are shown below the bars.

### Discussion

Because of the strain put upon existing

health services by rising costs and increasing demands, finding alternative methods of providing and utilizing available medical care has become imperative. The wide social gulf between the professional suppliers of health care and the poor makes them hesitant to avail of existing facilities, making it very difficult to improve their care in spite of their greater need. The locally recruited non-professional health worker, is better suited to bridge this gap and help the poor make better use of existing services. In addition, training the worker to carry out some of the jobs usually done by the professionals, frees the latter for more skilled work, thus reducing professional costs. Moreover, the worker improves his own position and often becomes an

**TABLE III—** Comparison Between the Development of the Field Workers and the Author in the 4 Fields of Development at 5 key Ages using the WSST

Key age (week)	Category	Motor		Adaptive		Language		Personal Social	
		FW	D	FW	D	FW	D	FW	D
6 (n=50)	N	23	28	23	28	22	25	18	14
	N <sup>-</sup>	16	14	13	11	14	13	16	13
	AB	11	8	14	11	14*	12	16	13
16 (n = 50)	N	21	23	19	19	22	22	20	20
	N <sup>-</sup>	17	15	15	16	15	15	15	14
	AB	13	14	9	10	10	10	13	11
28 (n = 50)	N	20	21	26	24	25	25	22	25
	N <sup>-</sup>	17	15	15	16	15	15	15	14
	AB	13	14	9	10	10	10	13	11
40 (n 50)	N	27	30	24	25	25	23	18	18
	N <sup>-</sup>	13	11	13	13	14	16	18	17
	AB	10	9	13	12	11	11	14	15
42 (n = 50)	N	22	20	24	24	24	24	19	20
	N <sup>-</sup>	16	18	15	16	15	15	17	17
	AB	12	12	11	10	11	11	14	13

N: Normal; N<sup>-</sup> : Borderline; AB: Abnormal; D: Doctor; FW: Field Worker.

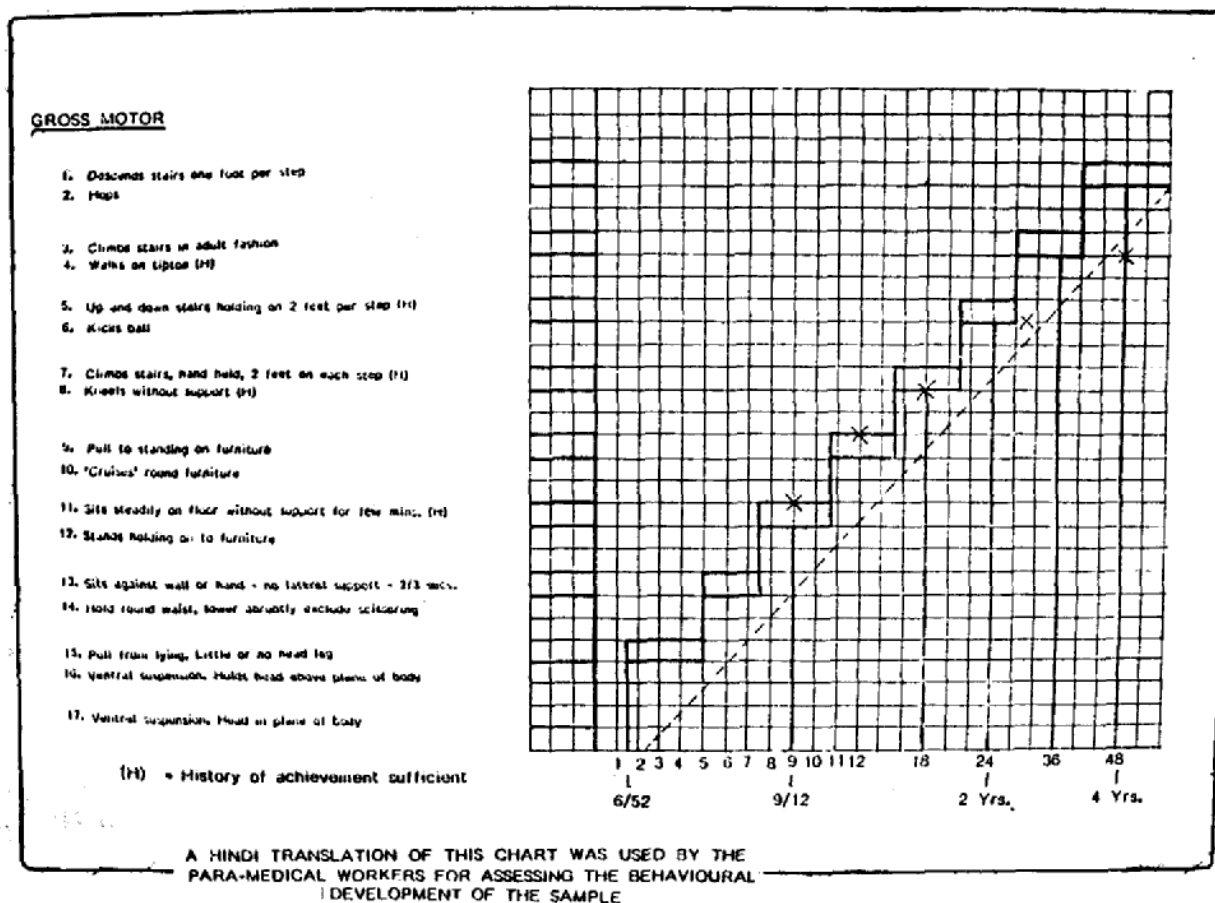


Fig. 1. Percentile sheet used for developmental record of pre-schoolers by the Woodside Health Centre.

independent contributing member of the community(4).

With proper job organization and appropriate training, the local worker can be employed to a far greater degree than is presently recognized, and unemployment rates of the country brought down. This was demonstrated during World War II, when with training and utilizing indigenous workers, the unemployment rate of the civilian population was reduced to 1%. The marked successes of the teacher aide, social worker aide, family planning worker, and the nurse aide program, which have relied largely upon the non-professionals serving in their own neighbourhoods, have demonstrated the feasibility of training non-professionals for new careers(1,4,7,8).

The job description for the screening

technicians required an ability to read the manuals (written in Hindi at primary to middle school level); administer tests to standards of proficiency, calculate the age of children (which required an ability to perform arithmetic at the fourth grade level); to write the results legibly; and to have good rapport with the poor and fellow health workers. In addition dependability was essential since many of the children would be scheduled for screening procedures later on.

The (WSST) was selected because it: (i) has been basically designed for use by health workers; (ii) contains short and simple tests for each of the four fields of development; (iii) has charts which allow a rapid visual comparison of the child's achievement with his peers and his own

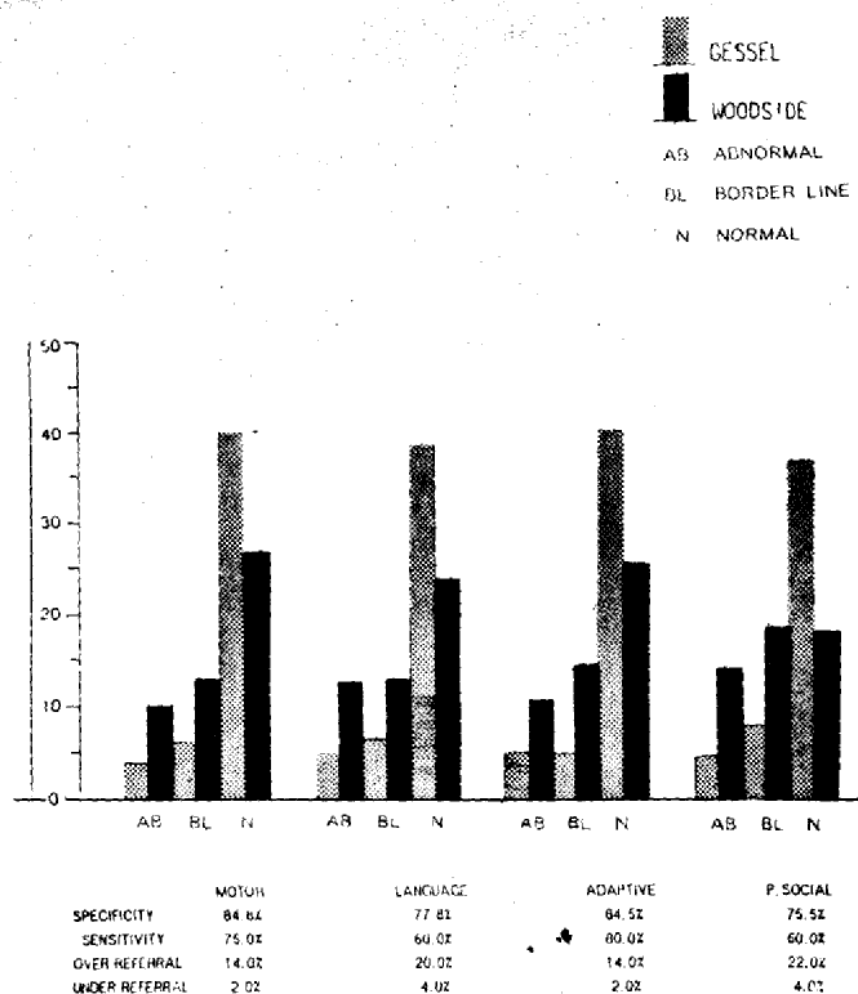


Fig. 2. Shows the difference in the scoring found at 40 weeks by using the WSST and the GDS.

previous level; (iv) has a clear threshold for referral to a doctor and when to a specialist; (v) has records which could be used to establish norms for threshold for referral in different communities; and (vi) takes hardly 5-10 minutes to test each child and is, therefore, economical and practical for screening large populations(1).

Since the number of paramedicals to be trained was large ( $n = 25$ ), written material and actual case demonstrations were heavily depended upon. Prolonged training periods without an opportunity for application of new skills frequently leads to lack of interest in the trainees(4), so they were asked to test children after 2-3 days of case

demonstration and encouraged to practise on as many as possible. Screening manuals written in Hindi were distributed from day 2 to thoroughly familiarize them with the screening procedure.

The first evaluation did not show good mastering of the skills by the workers, but with retraining very good levels of proficiency were achieved, with tester/author item agreement of 97%. This is a level commensurate with that recommended by the Colorado workers(9). Not only was the tester/tester reliability satisfactory (errors made by them were statistically insignificant), but the test/retest stability was good for a screening test(9).

To retain this high level of proficiency the supervisors kept a keen eye on the workers, and the author rescreened all the children within 3 days. The workers were, therefore, aware that they were being constantly supervised and cross-checked. A high degree of involvement of the trainees, which is maintained over the long term is necessary for the concept to work. Lack of teaching material like charts, video cassettes, slides, *etc.*, was acutely felt. The need for an illustrated Hindi Manual containing clear, precise and unequivocal instructions cannot be overemphasized.

The present study demonstrates that local non-professional health workers can be trained economically to administer the WSST. With a few modifications WSST meets all the criteria required for an efficient screening test and can be used effectively on a large scale in our country.

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