DISABILITY SCREENING SCHEDULE

AGE GROUP: Birth to six years

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INTRODUCTION:

World Health Organization defines Screening as "application to all children, born of certain procedures which can be carried out in a short time by less specialized member of the staff, and which gives an indication of the presence or absence of certain disabilities. If the result is positive, indicating actual or probable presence of a disability, the child is then referred to a specialist for investigation and care".

A Screening Test according to S Lingam, should detect latent or early symptomatic stages of a disease or disorder, and it should have high Sensitivity and Specificity.

The Disability Screening Schedule (DSS) hitherto developed is a broad screening test for children below 6 years of age for detecting latent or early symptomatic stages of disorders or diseases which may lead to physical-motor disability, visual disability, hearing disability or mental retardation. DSS identifies early signs of physical-motor disability, visual disability, hearing disability or mental retardation, and is a cross-disability screening test. It must be noted that DSS is not a diagnostic test. It helps identify 'at risk' and 'early signs' of disability, leaving the exact diagnosis of disease/disability on doctors and health practitioners.

SPECIAL CONSIDERATIONS WHILE PREPARING THE Disability Screening Schedule (DSS)

The following features were kept in kind while developing this test:-

1. It was to be short and brief
2. The administration time should be small
3. It should be easy to understand by any instructor including non-professional staff
4. Cost of screening should be nominal

5. The test should neither miss cases of disease (low false negative), nor diagnose a disease disorder in a healthy child (low false positive)
6. It should contain valid items which are able to screen children between 0-6 years for major disabilities, impairments and related problems
7. The test should have a high **sensitivity and specificity**

While developing the test, various other tests were studied, the major ones amongst those being:

(i) NIMH Development Screening Schedule
(ii) NIMH Development Assessment Schedule
(iii) Trivandrum Development Screening Chart
(iv) David Werner's Record Forms on Physical, Social and Cognitive Development
(v) Ten Question (T.Q.) screen by Lillian Belmont and others
(vi) Child Disability Questionnaire (CDQ) by Lillian Belmont and others
(vii) Screening Proforma for Mental Retardation developed by Genetics Unit, AIIMS

The above schedules mainly screened developmental delays, whereas the DSS was developed as a one-time screening schedule for all major disabilities in children below six years of age.

PILOT TESTING OF DSS

The initial instrument was a twelve page schedule. The schedule was pilot tested in three stages on 80 children. The final schedule was a short 3 page schedule with an administration time of 5-7 minutes. A large number of questions were close ended.

FIELD TESTING OF DSS

The DSS was used as a screening instrument by nineteen trained anganwadi workers for a house –to-house survey to identify within their community children who were 'at risk' or displayed signs of impairments, disorders and diseases. The DSS was administered on 3560 children belonging to nine urban slums of South Delhi. After the survey was completed the author re-examined the children who had been checked out on the DSS. This was done to assess the validity of the DSS.

A. Total children on the DSS = 3560
   Number of children screened
   Positive having an impairment
   on the DSS by the AWW = 245
   Number of children screened
   negative (found normal) on the
   DSS by the AWW = 3315

From 245 screened positive on DSS by the AWW, 219 (90%) were re-examined by the author. The review indicated that of these 10 children were actually disease free (false positive) and 209 had an impairment (true positive)

i) True Positive = 209
ii) False Positive = 10

B. From 3315 who had been screened negative on the DSS, 536 (17%) were re-examined. This reviewed indicated 25 children were having an impairment (false negative) and 511 were disease free (true negative)
   i) True Negative = 511
   ii) False Negative = 25

Where, True positive implies screened as having a disease and the disease is truly present.

'False positive' implies screened as having a disease, but the disease is absent.

'True negative' implies screened as disease free, and actually is disease free.

'False negative' implies screened as disease free, but actually disease is present.

The validity of the DSS was calculated by using the following formula

VALIDITY OF A SCREENING TEST

VALIDITY OF A SCREENING TEST				
DISEASE STATUS				
Screening Test		Present	Absent	Total
	Positive	a	b	(a+b)
	Negative	c	d	(c+d)
	Total	(a+c)	(b+d)	
Where: a – true positive b – false positive c – false negative d - true negative				

Source Beaglehole and Kjellstrom 1990

SENSITIVITY = a/a+c – Proportion of truly ill persons who are screened as ill by the screening test.

SPECIFICITY = d/b+d – Proportion of truly healthy persons who are screened so by the screening test.

VALIDITY OF THE DSS

IMPAIRMENT STATUS				
Screening Test		Present	Absent	Total
	Positive	209	10	219
	Negative	25	511	536
	Total	234	521	755

SENSITIVITY = 209/234 = 0.89

SPECIFICITY = 511/521 = 0.98

The Sensitivity and specificity of the screening instrument, viz DSS has come to be very high. This result shows the effectiveness of this instrument to detect efficiently and quite reliably (0.89 probability) an impairment in children below 6 years of age, if it is truly present. If the DSS screens a child as being impairment free there is a 0.98 probability of the child being normal.

ADVANTAGES OF DSS

1. It can be used for large scale surveys by non- medico staff to identify disabilities in young children
2. Cost of administration is low
3. It can be administered quickly
4. It is a one time screening test for Locomotor disability, Hearing disability, Visual disability and Intellectual disability
5. It has a very high sensitivity as well as a very high specificity.