SPOTLIGHT ON THE Developmental Milestones Checklist

Which version did you use?
Ans: DMC-II (with adaptation to Local Context)

1. What Key question did you select the DMC to answer?
Effectiveness of Enhanced Anganwadi Curriculum and Positive Parenting Programme on the motor and language development of children aged 0-5 years from remote rural areas of Central India (Wardha and Nagpur districts).

2. Please comment on how easy (or otherwise) it was to prepare the team to use it?
The tool was translated to Marathi from English and back-translated before going for training. List of necessary materials for conducting assessments was prepared and materials were procured. The candidates from Nursing and Social Work background with education of at least undergraduate level were trained and the DMC-II was piloted on under 5 children from Sawangi village of Wardha. After necessary adaptations, the tool was prepared on a ODK based android based app and imported to tablet PCs. Again this tool was piloted on 15 children of different age groups from 0-60 months and videos of all assessments were captured. The videos were played before trained data collectors and inter-rater, intra-rater exercises were conducted. Scoring was discussed among the teams. Following the piloting, the trained data collectors were mobilized to the field and collected data from 1875 households in 3 months period. Issues related to putting questions to mothers due to differences in local dialects and levels of understanding of mothers were solved by incorporating more local words while administering the tools.

3. Can you share a summary of any evaluation of its reliability that you made?
The reliability of the field investigators' scores was established through inter-rater and intra-rater exercises for 15 videos, examining the agreements on scores among the field investigators and those of an expert.

4. Can you share a summary of any other evaluation of the tool that you made?
Internal reliability estimates were all acceptable, with a Cronbach's a coefficient of 0.96 for the total score, 0.96 for motor, 0.97 for language, and 0.95 for personal-social subscales. Each subscale was significantly correlated with the others with the use of Pearson's correlation coefficient. Gross motor, fine motor and language development scores correlated with each other, with coefficients ranging from 0.82 to 1.00.

The sensitivity of the DMC-II to age was examined by correlating scores by child age in months. Correlations were as follows: overall scores: $r = 0.82$ ($P < 0.0001$), motor development score: $r = 0.82$ ($P < 0.0001$); language development score: $r = 0.83$ ($P < 0.0001$); and personal-social development score: $r=0.57$ ($P < 0.0001$).

5. Would you use it again and WHY ?

If YES or Maybe , can you add any evidence of the added value that it gave you
If NO can you summarize, preferably with evidence, its weaknesses.

Ans:
YES. The tool is easy to use and served our purposes well. Advantages are short administration time, can be administered by trained non-specialists, free of cost and sensitive to interventions.
Since Child development was a primary outcome of this trial, we were also looking for a tool which could be administered by trained non-specialists. We used the same data collectors to administer the DMC-II along with other tools like PSED, Maternal depression Agency, OMCI, Home Environment and Socio-demographic questionnaire. This saved time and costs. We appreciated that the assessment was free and data imported to server from our tablet PC based app is easier to export for analysis in STATA. We have ready to hand coding available for real time analysis of data and is a better option for thorough monitoring of data collection. Further, we chose the DMC-II because it had been shown to be sensitive to Parenting interventions.

Ref:

Use of the Developmental Milestones Checklist in Five Low- and Middle-Income Countries

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The post-2015 Sustainable Development Goals (SDGs) have placed early child development on the global policy agenda for the first time. The adoption of SDG 4.2, access to quality early child development for all, has created a demand for early child development (ECD) assessments in low- and middle-income countries (LMICs), where such assessments and personnel qualified to administer them often do not yet exist. ECD assessments are needed to track progress toward this SDG, to screen children for further evaluation and diagnosis, as well as to evaluate programs and interventions to inform evidence-based policy.

The Developmental Milestones Checklist (DMC) is an ECD assessment originally developed to monitor motor, language, and personal-social development of children age 0-24 months through caregiver interviews by community workers in rural Kenya (*n*=95 children age 2-12 months). A second version (DMC-II), incorporating both caregiver report and direct observation, was developed to evaluate the effects of an infant nutrition intervention in rural Burkina Faso (*n*=1122 children age 18 months). This version has also been used to evaluate interventions in Vietnam (*n*=743 children age 9 months) and Bihar, India (*n*=4360 children age 6-18 months) and in a baseline survey in Ghana, with an added set of cognitive items (*n*=330 children age 10-25 months). A third version (DMC-III) was developed in Maharashtra, India, with added motor and language items to extend the age range up to age 5 years, to evaluate the effects of an ECD intervention (*n*=1678 children age 0-5 years). Our objective was to evaluate the feasibility, reliability, and usefulness of the DMC in these different contexts.

In all projects, the DMC was successfully administered by data collectors with no or little prior experience in developmental assessment and with varying levels of education, ranging from a high school degree to a medical degree. Data collectors were able to reach high proficiency in administering and scoring the DMC-II, as evidenced by high inter-rater agreement in Maharashtra (91%) and high inter-tester reliability in Burkina Faso ($r>0.8$). In Kenya, mothers who were visited to complete the DMC monthly for 10 months reported that they found the procedures both acceptable and beneficial.

DMC-II scores were sensitive to the effects of early childhood interventions, including provision of nutritional supplements in Burkina Faso and supporting fathers' involvement in child development in Vietnam (difference between intervention and control groups for all subscales $p<0.001$). In all sites, internal reliability was high (*Cronbach's alpha*>0.6) and scores showed expected correlations with age ($p<0.001$) and linear growth ($p<0.05$). In 30 children in Ghana, the receptive language ($r=0.42$) and cognitive items ($r=0.46$) were significantly correlated with scores on the Bayley Scales of Infant Development III cognitive scale.

The DMC and its subsequent versions are reliable tools for developmental assessment that can be administered by personnel with no prior experience in

developmental assessment and varying levels of education. Little adaptation is required for different contexts. The DMC is a useful tool to evaluate programs and interventions to inform evidence-based policy aiming to achieve quality ECD for all children in LMICs.

Figure 1. Correlation of DMC Scores with Age in 5 Cohorts

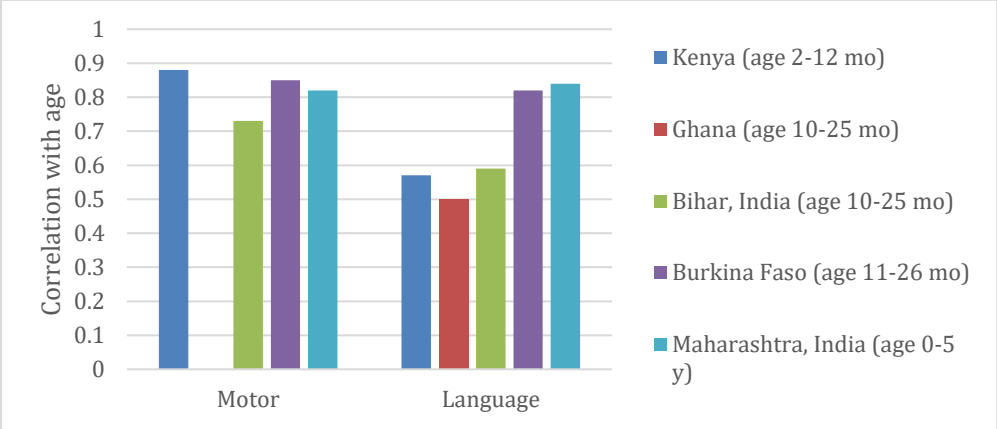

Figure 2. Difference in DMC Age-Adjusted Z-Scores between Stunted and Non-Stunted Children in 5 Cohorts