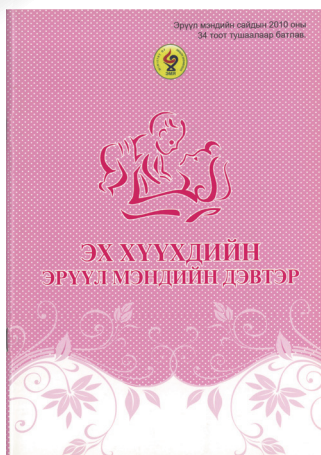




MONGOLIA: Prevention of cognitive development delay through MCH Handbook



Maternal and Child Health Handbook, Mongolia, 2010

New strategy to support young child development is needed

Foundation of health and well-being in adulthood is built in early childhood during the initial five years of life, particularly from conception through the first 1000 days. Young children having more opportunities for early learning have better chances to thrive. However, the learning environment is not always adequate for every child in the world. In developing countries, more than 200 million children under five years of age cannot reach their developmental potential. Although appropriate measures to be taken for early child development are well reported, a package of multifaceted supportive interventions including family care, health and education system, is needed. Therefore, introduction of universal, user-friendly and cost-effective tool for early child development should be considered.

Three-year follow-up of a clinical trial shows a significant result

The Maternal and Child Health (MCH) Handbook can be one of the user-friendly and cost-effective tools that can assist early child development. The MCH Handbook serves as a reference for the

physical, psychological, and social dimensions of a child's health. It functions as a monitoring tool of children's growth and development. It further serves as a tool that facilitates effective communication between families and health workers.

Our three-year follow-up of a cluster randomized controlled trial conducted in Mongolia examined the effectiveness of the MCH Handbook in child development. In the study, pregnant women of intervention group received the MCH Handbook upon their first antenatal visit, while those of control group did not. Three years later, risk of development delays in children of both groups were assessed using Mongolian Rapid Baby Scale (MORBAS), a validated child development screening tool comprised of seven developmental domains: (i) fine motor skills; (ii) gross motor skills; (iii) expressive language; (iv) receptive language; (v) cognition; (vi) social-emotional behavior; and (vii) adaptive behavior.

Table 1 presents the results of univariate analyses of the risks of delay in the respective developmental domains. It was found that the risk of delay in cognitive development was significantly lower in the intervention group. Therefore, multivariable analyses were conducted to examine it by controlling

▼ Table 1. Risk of child developmental delay by intervention groups using MORBAS

MORBAS-based child development ¹		Intervention (n ₁ =211)		Control (n ₂ =171)		P-value GEE analysis ²
		Number of cases	%	Number of cases	%	
Gross motor delay (n ₁ =211, n ₂ =171)	Yes	0	0	2	1.2	0.115
	No	211	100	169	98.8	
Fine motor delay (n ₁ =211, n ₂ =171)	Yes	33	15.6	27	15.8	0.837
	No	178	84.4	144	84.2	
Cognitive development delay (n ₁ =211, n ₂ =171)	Yes	14	6.6	23	13.4	0.049*
	No	197	93.4	148	86.5	
Adaptive behaviour (n ₁ =211, n ₂ =170)	Yes	1	0.5	2	1.2	0.429
	No	210	99.5	168	98.8	
Social-emotional delay (n ₁ =211, n ₂ =170)	Yes	3	1.4	1	0.6	0.560
	No	208	98.6	169	99.4	
Expressive communication delay (n ₁ =211, n ₂ =171)	Yes	7	3.3	7	4.1	0.642
	No	204	96.7	164	95.9	
Receptive communication delay (n ₁ =211, n ₂ =171)	Yes	8	3.8	11	6.4	0.183
	No	203	96.2	160	93.6	

¹ MORBAS: Mongolian Rapid Baby Scale

² GEE: Generalised estimating equations analysis

* p < 0.05



Three-year-old in study field

confounders and to further identify the possible potential risk factors for cognitive development delay (Table 2).

As a result, the MCH Handbook intervention showed a protective effect with an adjusted odds ratio (OR) of 0.32 (CI 95%: 0.14–0.73) in cognitive development delay among children. Maternal age with an adjusted OR of 1.07 (CI 95%: 1.01–1.14), being at maternal depression symptoms with an adjusted OR of 3.19 (CI 95%: 1.35–7.50), and pregnancy complication with an adjusted OR of 4.02 (CI 95%: 1.42–11.41) produced significant associations with the risk of cognitive development delay.

A further analysis was conducted to examine possible differences in mothers' use of the MCH Handbook between those having children at risk of cognitive development delay and those having children not at the risk. In the MCH Handbooks for children at no risk of cognitive development delay, both the data of infant health check-up results ($P=0.03$) and curves in growth chart ($P<0.001$) were more frequently recorded and drawn. Moreover, mothers who read the results of antenatal check-ups ($P=0.02$), delivery records ($P=0.04$), and child developmental milestones ($P=0.03$) had fewer children at risk of cognitive development delay.

MCH Handbook as a cost-effective tool for child development

Our study results suggest that active MCH Handbook use during the initial three years starting from the first ANC, by ensuring that infant check-up results are recorded and growth curves. Particularly,

mothers' practices of reading the records of antenatal care, delivery and developmental milestones are likely to contribute to reducing the risk of child cognitive development delay.

In the baseline data as of children at the age of one month, it was found that the distribution of the MCH Handbook was associated with the increase in the number of antenatal check-up visits. Thus, distribution of the MCH Handbook to pregnant women is likely to produce several positive impacts, i.e. not only increasing the number of antenatal health check-up visits, but also preventing children from having risks of cognitive development delay. Specifically, in our study, risk of cognitive development delay was lower among the children whose mothers used the MCH Handbook.

One of key findings of the study was that those who actively use the MCH Handbook tend to be more attentive and committed to practicing care for child development, and to communicating with their children. This way might lead to better consequences in children's cognitive development.

Conclusion

The MCH Handbook is likely to promote appropriate child development process, as a cost-effective and universally distributed tool. Furthermore, the policies enhancing the optimal use of the MCH Handbook by mothers and family members are necessary for better care for their children. The active use of the MCH Handbook should be promoted to ensure healthier future generations.

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▼ Table 2. Potential factors for risk of cognitive development delay

Predictors	Adjusted OR	CI 95%	P-value
MCH Handbook (intervention)	0.32	0.14 – 0.73	0.007**
Maternal age	1.07	1.01 – 1.14	0.031*
Maternal education	0.87	0.34 – 2.24	0.783
Marital status	1.36	0.31 – 5.95	0.680
Wealth index	0.72	0.47 – 1.09	0.126
Primigravid	1.50	0.65 – 3.42	0.333
Number of antenatal visit	0.86	0.74 – 1.01	0.074
Miscarriage	1.87	0.37 – 9.44	0.448
Second-hand smoking during pregnancy	0.90	0.39 – 2.05	0.799
Drink during pregnancy	0.79	0.47 – 1.35	0.400
Symptoms of maternal depression (GHQ)	3.19	1.35 – 7.50	0.008**
Pregnancy complication	4.02	1.42 – 11.41	0.009**
Gestational week	0.96	0.58 – 1.59	0.874
Birth weight	1.03	0.91 – 1.16	0.638
Apgar score	1.08	0.62 – 1.88	0.765
Breastfeeding start	0.50	0.16 – 1.56	0.236
Crowding	1.17	0.57 – 2.41	0.664

* $p < 0.05$, ** $p < 0.01$

Further readings

1. Dagvadorj A, et al. Cluster randomised controlled trial showed that maternal and child health handbook was effective for child cognitive development in Mongolia. *Acta Paediatrica* 2017; **106**(8): 1360-1.
2. Dagvadorj A, Takehara K, Bavuusuren B, Morisaki N, Gochoo S, Mori R. The quick and easy Mongolian Rapid Baby Scale shows good concurrent validity and sensitivity. *Acta Paediatrica* 2015; **104**(3): e94-e9.
3. Mori R, Noma H, et al. The Maternal and Child Health (MCH) Handbook in Mongolia: A Cluster-Randomized, Controlled Trial. *Plos One* 2015; **10**(4): e0119772.