

LIST OF Supplementary Materials

Supplementary Material S1:

The extract below illustrates search terms that will be used to identify research studies of culturally adapted intervention parenting interventions for South Asians:

(Culturally adapted OR minority community OR ethnic minorities OR Black and ethnic minority OR BAME) AND (Parents OR psychosocial intervention OR parenting intervention OR mothers OR fathers OR children OR mother* OR maternal OR father* OR paternal OR parent* OR child* OR adolescen* OR paediatric OR pediatric OR teen OR youth OR famil* OR parent* OR Carer*) AND (e-health OR eHealth OR change" OR "behavior change" OR promot* OR "health behaviour" OR "health behavior" RCT OR interven* OR program* OR manag* OR prevent* OR Clinical trial OR intervention* OR trial OR "randomized controlled trial" OR RCT OR "cluster randomised control trial" OR "cluster randomized control trial" OR "crossover" OR Feasibility OR Pilot OR program evaluation OR acceptability OR sustainability OR qualitative) AND (Pakistan* OR India* OR Nepal* OR Bhutan* OR Bangladesh* OR Maldiv* OR Sri Lanka*)

Supplementary Material S2: *List of parenting intervention included in the studies.*

PARENTING INTERVENTION	INTERVENTION DESCRIPTION	STUDIES
Psychosocial stimulation.	Improving the mother-child interaction, providing developmentally appropriate activities. The importance of praising children, giving positive feedback, chatting with them, punishment was discouraged. Included traditional games and songs and produced low-cost picture books suitable for Bangladeshi children and mothers with little reading ability.	(1-3) (4-7)
Learning through play (1)	Provide parents with developmentally appropriate messages to stimulate early child development in a culturally appropriate format. Participant's were given a pictorial calendar devised for parents which depicts eight	(7, 8)

	successive stages of child development from birth to 3 years along with illustrations of parent-child play and other activities that promote parental involvement, learning, and attachment.	
Learning through play + Thinking healthy programme (THP)	In addition to LTP intervention, the THP manual includes step-by-step instructions and uses CBT techniques. Each session organized into five modules. Each module focuses on the following three areas: the mother's personal health, the mother- infant relationship, and the psychosocial support of significant others.	(9-12)
Combined educational intervention.	The participants were provided eight messages and skills on responsive feeding, developmental stimulation messages using five simple toys. - age-appropriate messages and skills on how to understand and respond to infants' cues of hunger/appetite or satiation. Received developmentally appropriate toys five times during the intervention with instructions on how to use them to engage and play with their children.	(13)
Parent management training- Oregon model (PMTO)	The intervention effectively prevents and improves children's behavior problems by replacing coercive interactions with positive parenting practices. The focus is on teaching parents skills to prevent and children's conduct problems (e.g., aggression, externalising, antisocial, delinquent behavior) as well as improve prosocial behavior (e.g., social skills, academic functioning).	(14, 15)
Parenting programme.	The program concerned parenting practices related to health, nutrition, communication and play: specifically showing love and avoiding harsh discipline and responsive	(16)

	self-feeding. -government- paid family welfare assistants who were instructed to deliver messages during a 10-min counselling session to mothers of young children at home and at their community clinics	
Reach-Up curriculum for early childhood stimulation	Components to improve Psychosocial stimulation (e.g. teach mothers on age appropriate activities, home made books and interaction with children during daily household). Health care and nutrition (e.g. Teach mothers on importance of colostrum, breastfeeding, pregnancy and delivery problems) Maternal mental health. (e.g. behavioural activation through thinking healthy program on managing relations with child and people around her.	(17)

Supplementary Material S3: *Details of measures used for child development, Parenting and parent's health measures in all the studies.*

MEASURES FOR CHILD DEVELOPMENT

Measures	Studies
Revised version of Bayley Scales of Infant Development (BSID-II)	(1, 13, 18)
Bayley scales of infant and toddler development scale	(3, 4, 6, 16)
Anthropometer including behaviour 9- point scale	(1)
World Health Organisation (WHO) indicators of infant and young child feeding practices.	(3, 13)
The Ages and stages 3 rd edition questionnaire	(6, 11, 18)
ECD module of the UNICEF Multiple Cluster Index Surveys	(4)
Infant Development Questionnaire (IDQ)	(8, 9)

Conduct problem composite (CP composite)	(14, 15)
Home inventory measure	(16)
Infant Development Questionnaire (IDQ)	(8)
Teacher report form (TRF)	(15)
Social skills rating system	(15)

MEASURES TO ASSESS PARENTING:

Measures	Studies
The learning through, Attitude and practices (KAP)	(7, 11)
Observation of Mother and Child Interaction (OMCI)	(4)
Maternal Attachment Inventory (MAI)	(10)
UNICEF's Family Care Indicators (FCI)	(6)
Parent Practices Interview	(14, 15)
Home Observation for Measurement of the Environment.	(11)
Maternal knowledge of child development	(6)
Mothers' knowledge of the ages for child development	(16)
Maternal knowledge & belief	(13)
Family satisfaction Survey (FFS;)	(15)

MEASURES TO ASSESS PARENT'S DISTRESS:

Measures	Studies
Edinburgh Postnatal Depression Scale (EPDS)	(7, 9, 10)
The Hamilton Depression Rating Scale (HAM-D)	(7, 9, 10)
Short versions of the Center for Epidemiologic Studies depression scale (CES-D):	(6, 13, 16)
Self-reporting questionnaire (SRQ-20)	(8, 9)

Short version of the Hopkins Symptom Check List-5 (SCL-5)	(14)
Parenting Stress Index – Short Form (PSI)	(7)
Rosenberg Self-Esteem Scale (Rosen- berg SES)	(7, 9)
The Multidimensional Scale of Perceived Social (MPSS)	(7, 9, 11)
Social Support Scale (OSLO-3)	(6)
The Brief Disability Questionnaire (BDQ)	(7, 9, 11)
Euro-QoL (EQ-5D)	(7, 10)
The Patient Health Questionnaire (PHQ-9)	(11)

Supplementary Material S4: Results of the risk of bias assessment for RCTs

		Risk of bias domains					
		D1	D2	D3	D4	D5	Overall
Study	Hamadani (2006)	+	+	+	+	+	+
	Mc-Gregor (2020)	+	+	+	+	X	X
	Ara (2019)	-	+	X	X	+	X
	Yousafzai (2015)	-	+	+	+	-	-
	Husain (2017)	+	+	X	+	+	X
	Husain (2021)	-	+	+	+	+	-
	Yousafzai (2014)	-	+	-	X	X	X
	Andrew (2020)	+	+	+	+	X	X
	Vazir (2013)	+	+	+	+	+	+
	Bjorknes (2015)	X	+	+	X	+	X
	Aboud (2013)	+	+	+	+	+	+
	Husain. (2021)	-	+	+	+	X	X
	Rahman (2009)	-	-	-	+	+	-
	Bjorknes (2013)	+	+	+	X	+	X

Domains:
D1: Bias arising from the randomization process.
D2: Bias due to deviations from intended intervention.
D3: Bias due to missing outcome data.
D4: Bias in measurement of the outcome.
D5: Bias in selection of the reported result.

Judgement
X High
- Some concerns
+ Low

Supplementary Material S5: Summary of studies meeting cultural adaptation criteria

<u>Ecological validity model component</u>	<u>Total number of studies meeting the criteria</u>	<u>Studies meeting the criteria.</u>	<u>Examples of studies meeting the criteria.</u>
Language	15	(1, 3, 7-19)	Local language considered in delivery of the intervention.
Persons	15	(1, 3, 6-8, 15, 17, 18).	Therapist and clients were ethnically matched, e.g. not just matched on language but recruited from same village as the participant's.
Metaphors	9	(1, 7-12, 16, 17)	Cultural uniqueness concepts such as joint family system in south Asian culture were addressed.
Content	15	(1, 7-12, 14, 15, 18)	Addressing cultural issues affecting mothers and specifically targeting them.
Concepts	8	(1, 7-12, 16)	Problem was conceptualised and presented to them in a culturally appropriate manner. E.g., Using pictorial formats and physical activities to cater for rural population.
Goals	7	(7-12)	Participants were given goals between the intervention sessions, while keeping cultural appropriation in mind.
Methods	12	(1, 3, 6, 7-13, 16, 17)	culturally appropriate methods used to construct messages based on local beliefs on child development.
Context	9	(1, 7, 9-12, 14, 16) (14, 15, 17)	Using local cultural narrative, idioms, and images, books to explain concepts. E.g. dressing up dolls in Bangladeshi attire.

Supplementary Material S6: Grading Evidence Profile

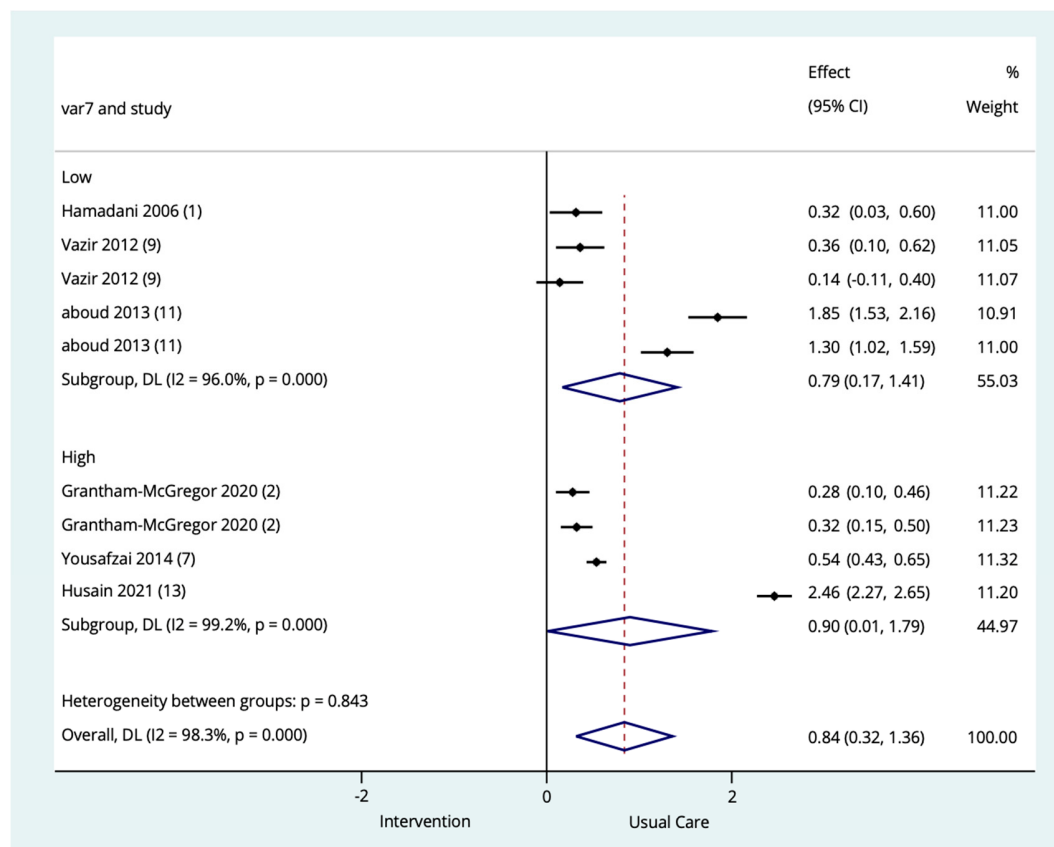
Table S1. GRADE Evidence Profile: Overall Certainty of Evidence for Culturally Adapted Parenting Interventions.

Domain	Assessment	Explanation
Study limitations (risk of bias)	Serious	Several studies had unclear allocation, blinding, and incomplete outcome data.
Inconsistency	Serious	Substantial heterogeneity across studies (I^2 often > 90%) and variability in interventions and populations.
Indirectness	Not serious	Participants, interventions, and outcomes were generally applicable to the target population.
Imprecision	Serious	Many studies had small sample sizes or wide confidence intervals.
Publication bias	Undetected/possible	Cannot be fully ruled out due to small number of studies per outcome.
Overall certainty of evidence: <i>Low</i>		

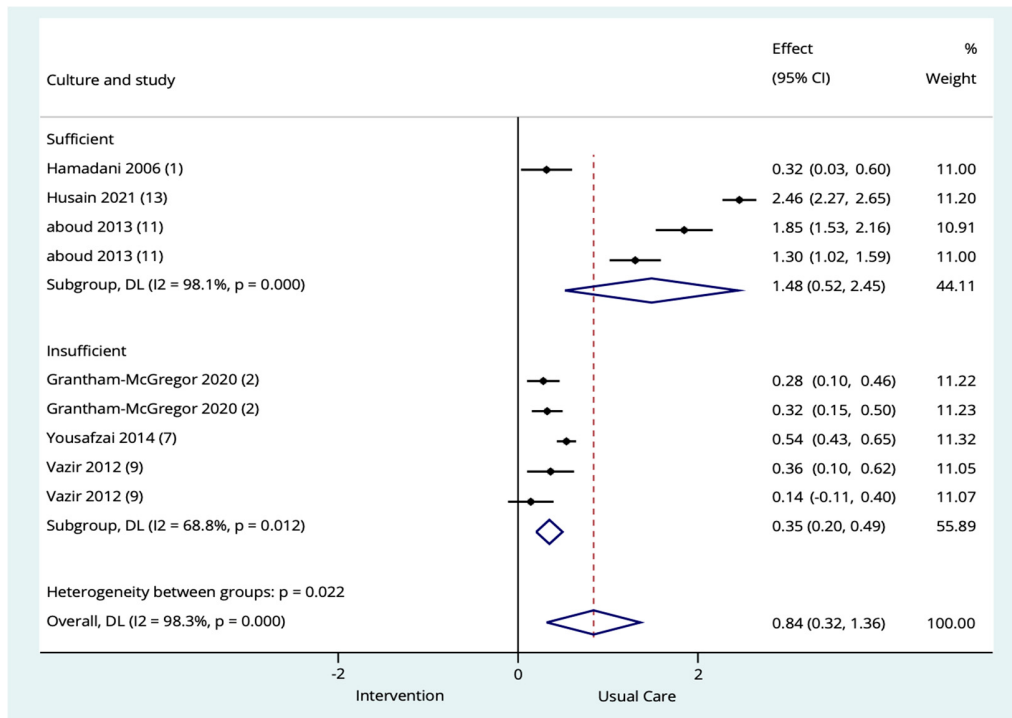
Supplementary Material S7: Forest Plots

FOREST PLOTS: SENSITIVITY ANALYSIS

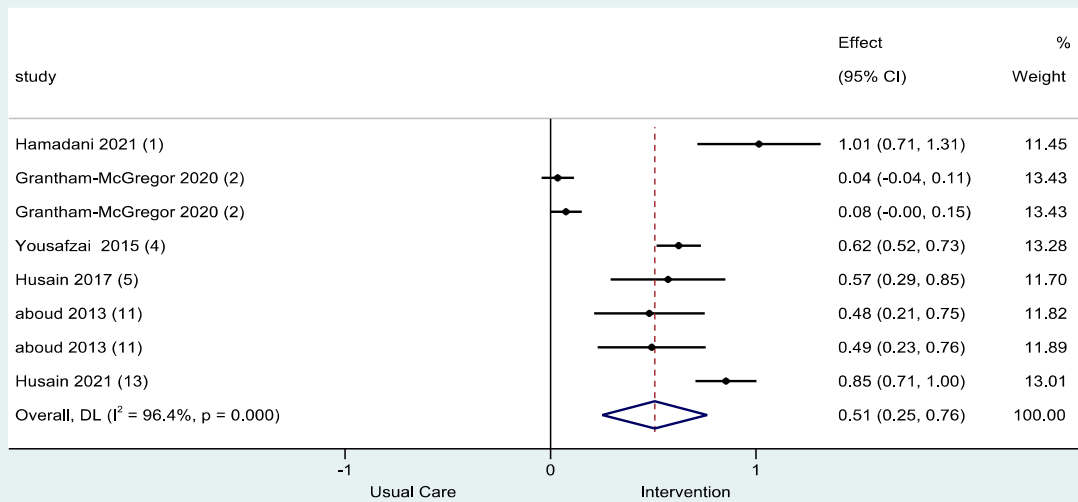
Effects of interventions on children's cognitive development by risk of bias ratings.



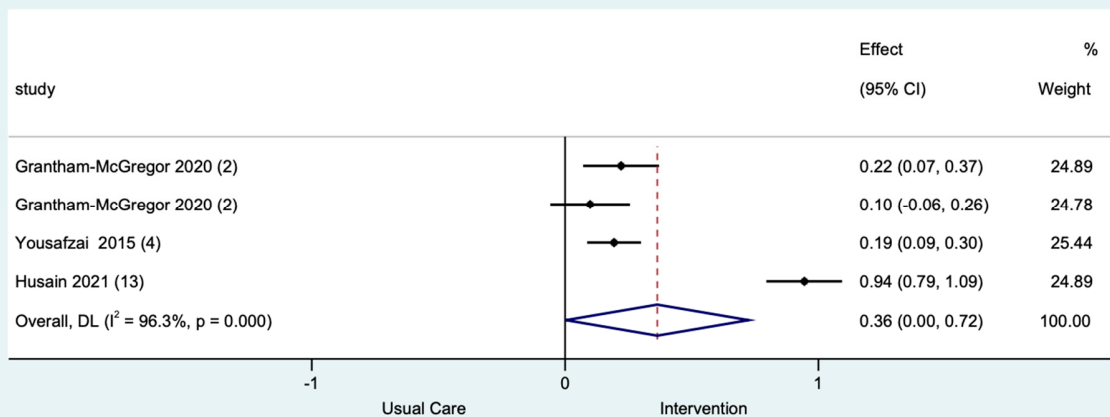
Effects of interventions on child cognitive development by cultural adaptation rating.

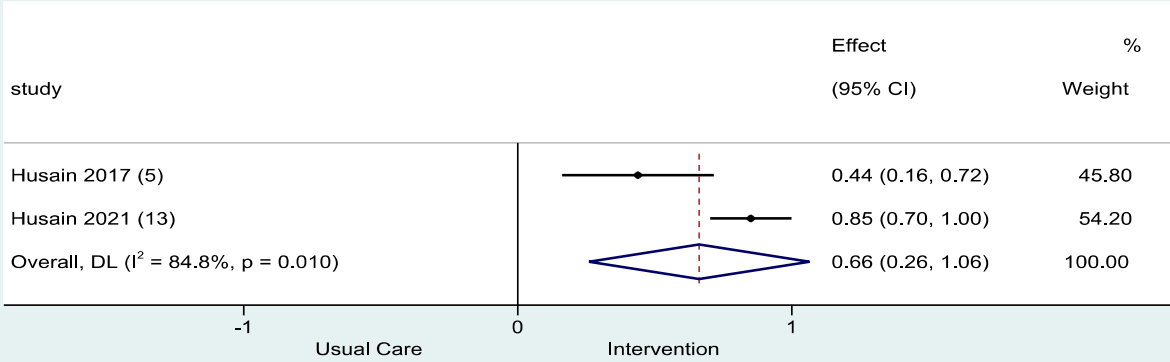
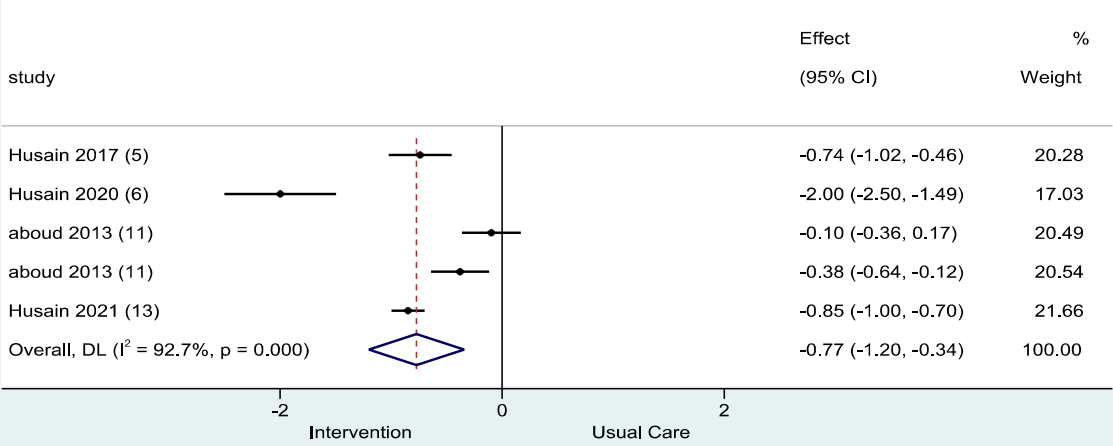


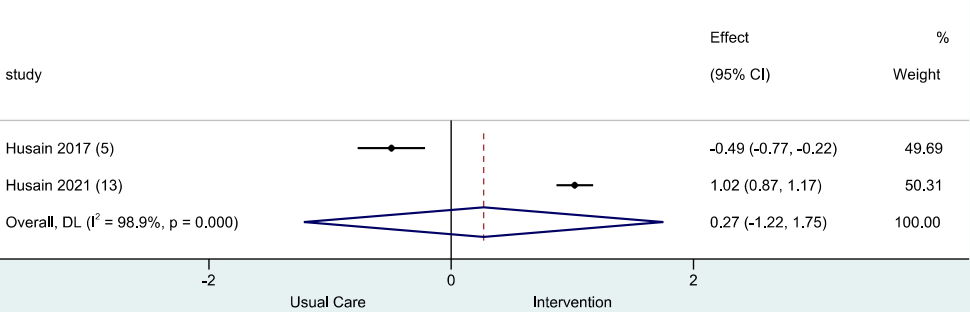
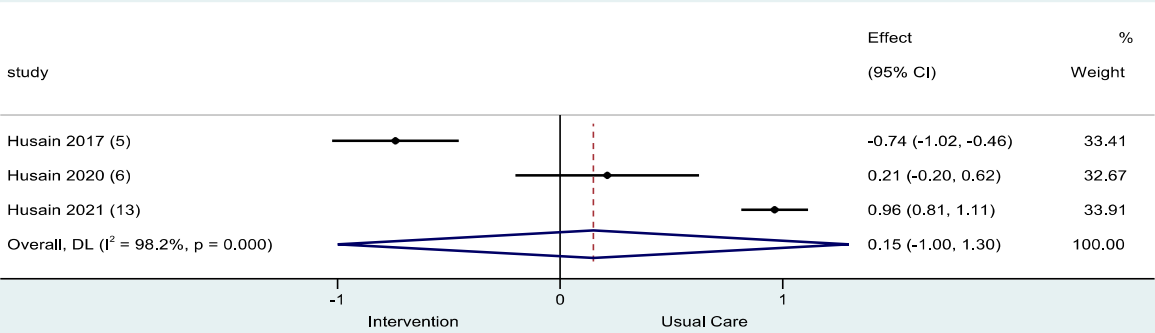
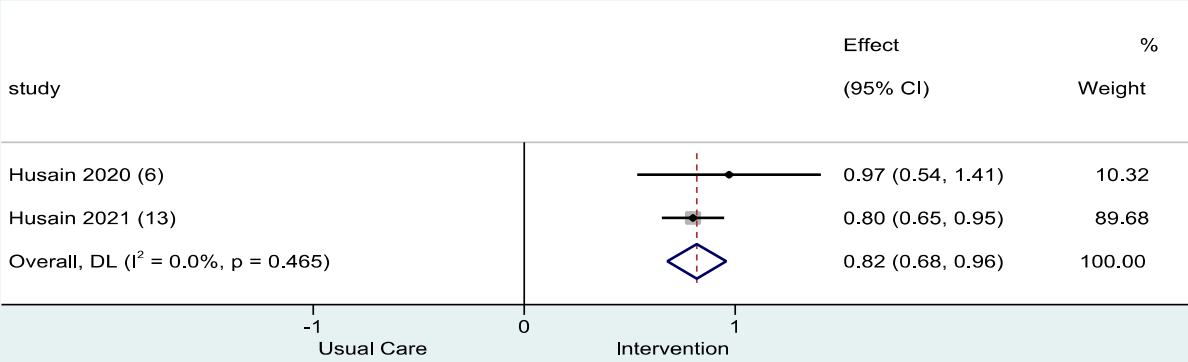
Parenting knowledge:



Parental Involvement:

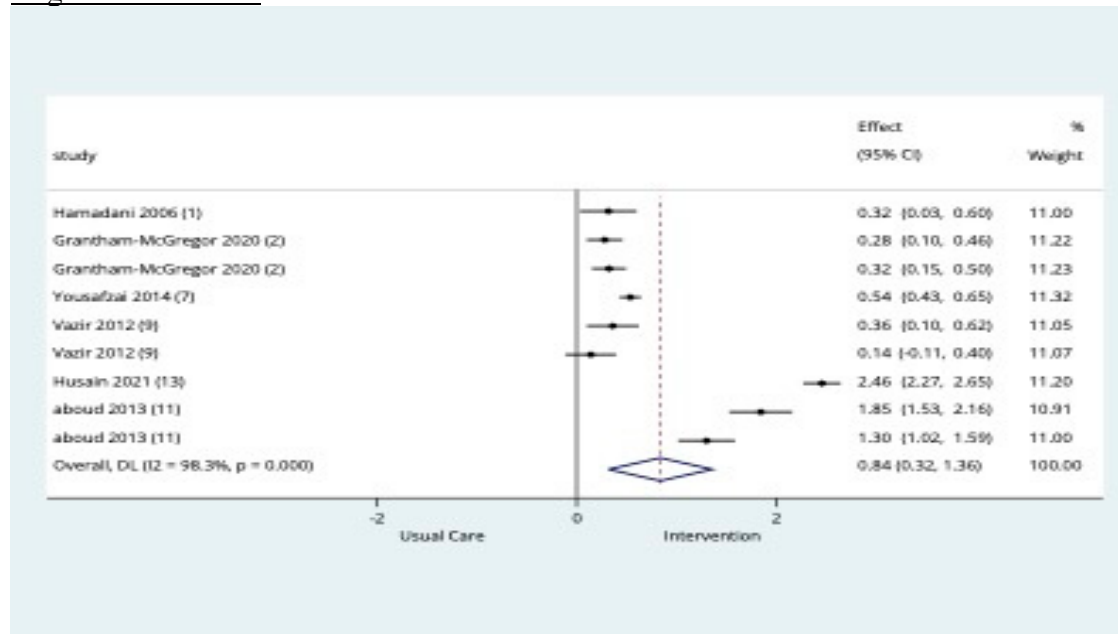




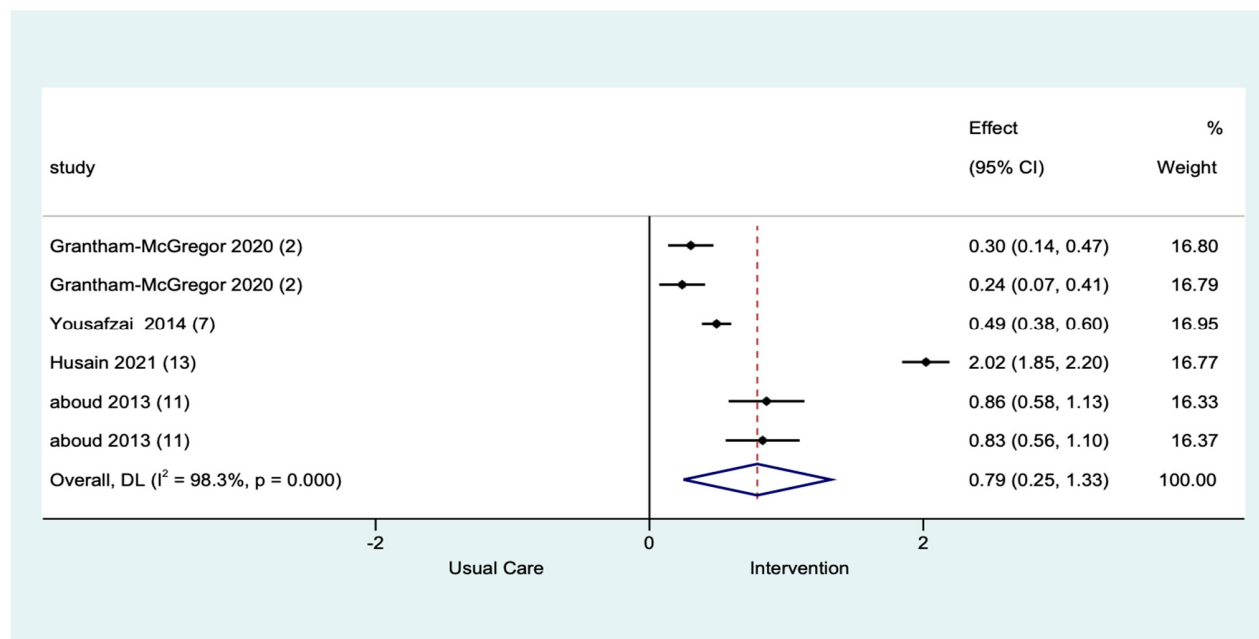


CHILD OUTCOMES:

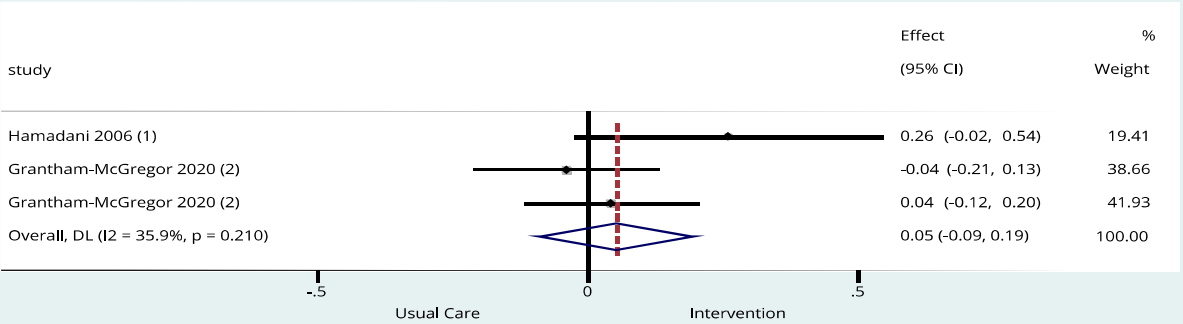
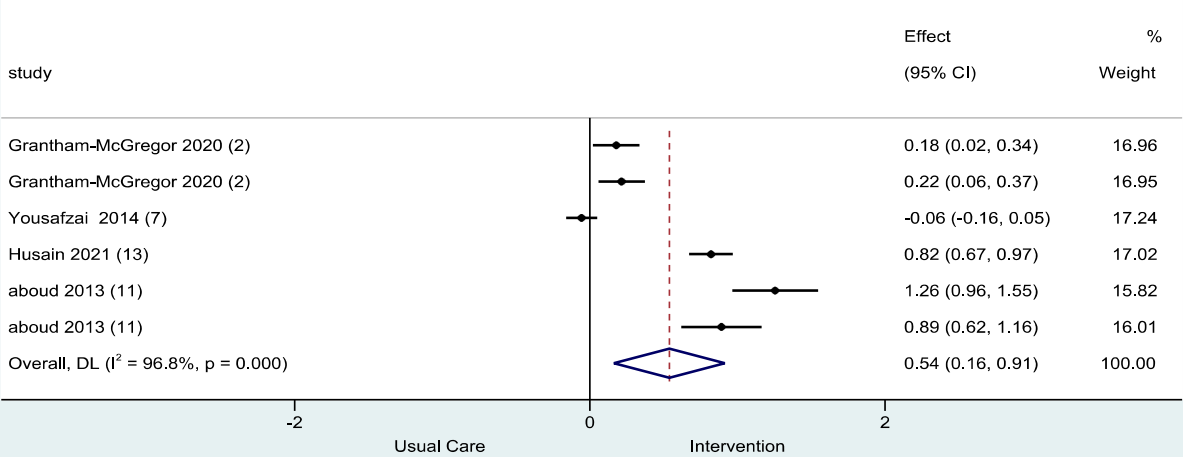
Cognitive outcomes

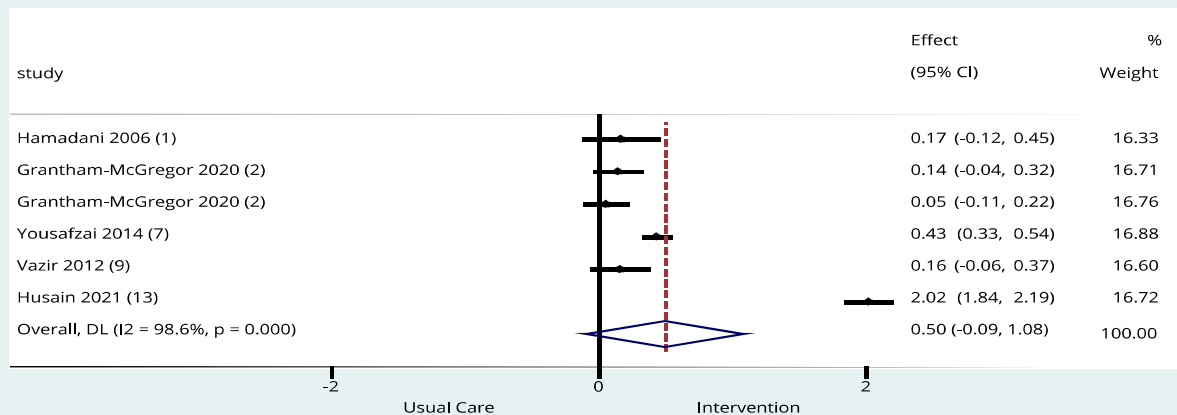


Language development



Social development





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