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Identifying Behavioral Associates of Childhood Development During 36 to 48 Months in Bangladesh

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Abstract

The role of early years of a child's life has a far-reaching impact in shaping lifelong outcomes. This paper has investigated the skill development of children aged between 36 and 48 months in Bangladesh to determine its association with the parenting attitude along with some child and maternal characteristics. The data from the latest round of Multiple Indicator Cluster Surveys (MICS 2019) are used for the analysis. The analytical approach constituted three separate binary logistic regression models (respectively for physical skills, social skills, and cognitive skills) to identify the behavioral associates of the child development. The findings depict child beating as a potential determinant for the obstructed physical skill development whereas spending the quality time with children is found to enhance social skills. Some other significant factors of the child development include division, weight of child, mother's media exposure, and wealth index. Hence, this study has suggested some policy implications to strengthen preventive programs on child abuse, promote parent-child interaction, and encourage maternal media exposure to mitigate early childhood developmental barriers.

Keywords: Attitude towards child, Cognitive skill, Early-childhood-development, Logistic regression model, Physical skill, Social skill

I. Introduction

The childhood with which a human life starts, is one of the most fundamental and critical periods for a person. Thus, the development in this period is highly decisive throughout the world as it underpins all the future learning and behavior[1]. In fact, during the first three years of life, the brain is responsive to the surroundings and different experiences[2]. A healthy early-childhood-development (ECD), which includes the physical, social, emotional, and cognitive domains of development, influences children's overall health and well-being and establishes their developmental trajectories and life-courses[3-4].

However, apart from the biological factors, it is now well accepted that the children's development is shaped significantly by the quality of their homes, neighborhood, characteristics of their parents and social factors[5-6]. The World Health Organization (WHO) highlights the importance of positive attitude towards child, like respect for children, acceptance of diversity, good parenting, patience and optimistic attitude towards children[7]. The new sustainable development agenda aims to ensure quality pre-primary education and development during early childhood, and care for children worldwide to make them prepared for primary school by 2030[8]. This growing concern has prompted national and international calls for the investment in ECD and adequate research to identify specific factors in children's physical, socio-emotional and cognitive development[9].

UNICEF developed and validated the Early Childhood Development Index (ECDI), which measures four areas of development: physical, literacy-numeracy, learning and social–emotional[10]. The resulting scores reflect whether children are developmentally on track in each of the four domains and overall. This index is the first international population-based measure of ECD for low- and middle-income countries. According to WHO, Bangladesh is one of the ten nations which is the homeland of the most disadvantaged children, in the context of cognitive and social-emotional development[11]. According to the MICS conducted in Bangladesh from 2012 and 2019, respectively 25.26% and 70% of the children did not meet the ECDI's standards for development[12].Children aged 48–59 months showed a greater ECDI compared to those aged 36–47 months[13]. Most of the child-development oriented research portrayed the development of children aged 3−4 years while some concentrated on the children with age less than 5 years. Thus, the development of children during the first three years have been overlooked by Bangladeshi research so far.

On the other hand, home parenting, an important factor, to which young children are mostly exposed, out of the three main living environments for children (natural environment, social environment, and family environment)[14], has not been comprehensively scrutinized by the research on ECD especially in Bangladesh. However, home ambiance should be an interesting research topic in the field of child development since it accelerates

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young children's development in the motor and cognitive skills[15]. Keeping these issues in view, this study aims to identify the potential determinants of early development among children aged from 36 to 48 months focusing on three domains of development, those are physical, social, and cognitive. It also determines how positive attitude expedites development of children and negative behavior hinders their development. The fourth year is excluded from the analysis as this study attempts to project the influence of home environment on the development of children's behavioral changes and growth on the familial factors. In fact, the pre-schooling age, that is, the fourth year of a child's life gets entangled with outside world since some children start going to preschool or other educational institution at this age. Analysis of this age group cannot solely illustrate the parental or other family members' behavioral impacts on children's early development. Hence, the current work focuses on the development that occurs before attending pre-school excluding the literary-numeracy domain.

This paper is organized into four sections. In section 2, a short description of data source and methodology are presented, including the description of outcome and explanatory variables used in the study. The following sections display the results obtained from univariate, bivariate and binary logistic regression models. Finally, the concluding section discusses about the major findings of the study and suggests some recommendations for policymakers.

II. Data and Methods

Data and Variables

The data used in this study have been extracted from the Bangladesh MICS, 2019. This survey was designed to provide estimates for a large number of indicators on the situation of children and women at the national level. The sample is taken from urban and rural areas, a total of eight divisions and sixty-four districts. The survey sampled from 3200 primary sampling units (PSUs) and 64600 households. Each district's urban and rural areas were defined as the primary stratum for sampling, and the households were sampled in two steps. A predetermined number of census enumeration areas were chosen within each stratum, with probability proportional to size[16]. A total of 4689 observations are analyzed in this study.

The important milestones between 36 and 48 months set by Centers for Disease Control and Prevention and UNICEF has been used in this study in order to construct the outcome variables[17-18].Three dependent variables (physical skill, social skill, cognitive skill) have been targeted for the purpose of analysis and each of these variables gives a binary outcome (satisfactory, not satisfactory). Satisfactory physical skill (PS) can be achieved if a child possesses the two characteristics: ability to pick up an object with two fingers and being healthy enough to play. Social skill (SS) gives satisfactory result if a child gets along with other children. Satisfactory cognitive skill (CS) can be attained if a child fulfills at least three of the four characteristics: following simple directions, ability to do something independently, understanding parents without difficulty and being understood by parents without difficulty.

A number of categorical covariates are considered in the study to determine the potential determinants of childhood development. These covariates are grouped into three sections depending on characteristics of child, characteristics of mother and attitude towards child. The covariates under characteristics of child are: gender (Male, Female), living area (Urban, Rural), division (Barishal, Chattogram, Dhaka, Khulna, Mymensingh, Rajshahi, Rangpur, Sylhet) and weight (Over-weight, Normal, Under-weight). The covariate "weight" is computed from weight for age z-score. If the weight for age z-score is greater than 2, it is labelled as over-weight. On the other hand, if the z-score lies between -2 to 2, it is labelled as normal and for under-weighted children, the z-score is less than -2.

The characteristics of mother contains the covariates like education (Illiterate, Primary, Secondary, Higher Secondary), wealth index (Poor, Middle, Rich), media exposure (Unexposed, Exposed), age at childbirth (Under-aged, Middle-aged, Over-aged), estimation of happiness (Unhappy, Happy), functional difficulty (Difficulty, No Difficulty) and difficulty remembering/concentrating (Difficulty, No Difficulty). If a woman is exposed to at least one of the media like newspaper/magazine, radio, and television, then she is considered to have media exposure otherwise not. The women who gave birth at age of less than 19 years are assigned to the "Under-aged" category. On the other hand, "Middle-aged" and "Over-aged" categories encompass mothers who were aged 19-30 years and above 30 years, respectively, while giving birth to the respondent of interest. In the case of the covariate named estimation of happiness, both neutral and happy mothers are assigned into the happy category.

The section attitude towards child contains two covariates: child beating (Yes, No) and quality time (Absent, Present). The children who are excessively beaten up are assigned into the "yes" category of the child beating variable and the remaining ones constitute the "no" category. While constructing the "quality time" variable, five fun activities

like reading and telling stories, singing songs, taking outside and playing with child with children are taken into consideration. If any of these five activities is present in a child's day-to-day life, then the corresponding child has been considered in the "present" group. If this is not the case, "absent" has been the appropriate category for the child of interest since quality time is absent in his/her life.

Methodology

This study initiates with the exploratory analysis using descriptive statistics like frequency and percentage for each category of the selected covariates. Next, it has conducted bivariate analysis to analyze the unadjusted association between the dependent and independent variables. Chi-square test is performed to investigate the statistical significance of such associations[19]. Finally, this work relies on binary logistic regression model, which is appropriate to analyze a binary target variable[20-21]. It simulates how a number of covariates and binary outcome interact.

Let Y_i be the binary response with mean μ_i and $X_i = (x_{io}, x_{i1}, x_{i2}, \dots, x_{ij}, \dots x_{ip})'$ be the set of covariates (with $x_{io} = 1$) for the i^{th} $(i = 1,2, \dots, n)$ individual. Also let $\beta = (\beta_0, \dots, \beta_j, \dots, \beta_p)'$ be the regression coefficients. The probability density function of Y_i, denoted as $f(Y_i)$, is a member of the exponential family with the canonical form,

$$f(y_i) = \pi_i{}^{y_i}(1-\pi_i)^{1-y_i} = \exp[\, y_i \log\left(\frac{\pi_i}{1-\pi_i}\right) + \log(1-\pi_i)\,]$$

Here, $\pi_i = \pi(x_i) = P(Y_i = 1|X_i = x_i) = 1 - P(Y_i = 0|X_i = x_i)$. The generalized linear model (GLM) for binary response can be written as: $Log\,(\frac{\mu_i}{1-\mu_i}) = x_i'\,\beta$. This is also called a logit model. The link function permits the mean of response to be related non-linearly with the covariates since $\mu_i = [1 + \exp(-x_i'\beta)]^{-1}$. This model is known as binary logistic model. The parameters of this model are estimated using maximum likelihood estimation approach.

All the analyses of this study have been conducted using SPSS of version 25.

III. Results

Univariate and Bivariate Analyses

Table 1 depicts the result of both univariate and bivariate analyses showing percentage of the categories of selected covariates and the percentage distribution of the outcome variables (PS, SS, and CS) within the categories of the covariates of interest. The *p* values included in this table evaluate the statistical significance of such unadjusted associations.

Table 1. (a) Exploratory analyses of selected covariates showing their overall percentages and percentages of physical skill (PS), social skill (SS), and cognitive skill(CS) within the categories of covariates along with the *p* values of Chi-square test of independence

Variables	Percentage (%)	PS			SS			CS		
		NS	S	*p* value	NS	S	*p* value	NS	S	*p* value
Characteristics of Child										
Gender (4689)										
Male (2402)	51.2	30.2	60.8	0.595	5.8	94.2	0.829	13.0	87.0	0.120
Female (2287)	48.8	29.5	70.5		5.6	94.4		11.5	88.5	
Living Area (4689)										
Urban (851)	18.1	29.3	70.7	0.663	5.2	94.8	0.449	11.6	88.4	0.536
Rural (3838)	81.9	30.0	70.0		5.8	94.2		12.4	87.6	
Division (4689)										
Barishal (420)	9.0	31.7	68.3	<0.001	5.2	94.8	<0.001	16.4	83.6	<0.001
Chattogram (957)	20.4	41.3	58.7		7.6	92.4		14.3	85.7	
Dhaka (918)	19.6	23.1	76.9		5.1	94.9		8.9	91.1	
Khulna (667)	14.2	22.0	78.0		2.1	97.9		8.7	91.3	
Mymensingh (273)	5.8	39.2	60.8		8.4	91.6		14.3	85.7	
Rajshahi (489)	10.4	26.2	73.8		4.1	95.9		10.6	89.4	
Rangpur (561)	12	24.8	75.2		7.3	92.7		10.0	90.0	
Sylhet (404)	8.6	34.7	65.3		6.9	93.1		20.3	79.7	

Table 1. (b) Exploratory analyses of selected covariates showing their overall percentages and percentages of physical skill (PS), social skill (SS), and cognitive skill (CS) within the categories of covariates along with the *p* values of Chi-square test of independence

Variables	Percentage (%)	PS			SS			CS		
		NS	S	*p* value	NS	S	*p* value	NS	S	*p* value
Weight (4689)										
Over-weighted (185)	3.9	40.5	59.5		9.7	90.3		17.8	82.2	
Normal (3373)	71.9	28.2	71.8	<0.001	5.2	94.8	0.011	11.6	88.4	0.018
Under-weighted (1131)	24.1	33.2	66.8		6.6	93.4		13.4	86.6	
Characteristics of Mother										
Education (4689)										
Illiterate (544)	11.6	34.9	65.1		7.0	93.0		15.6	84.4	
Primary (1142)	24.4	33.3	66.7	<0.001	6.0	94.0	0.418	13.7	86.3	0.009
Secondary (2316)	49.4	28.2	71.8		5.5	94.5		11.3	88.7	
Higher Secondary (687)	14.7	26.1	73.9		4.9	95.1		10.6	89.4	
Wealth Index (4689)										
Poor (2171)	46.3	32.6	67.4		5.9	94.1		13.8	86.2	
Middle (881)	18.8	26.4	73.6	0.001	5.9	94.1	.687	12.6	87.4	0.002
Rich (1637)	34.9	21.8	71.9		5.3	94.7		10.0	90.0	
Media Exposure (4689)										
Unexposed (1735)	37.0	34.1	65.9		6.8	93.2		15.3	84.7	
Exposed (2954)	63.0	27.4	72.6	<0.001	5.1	94.9	0.014	10.5	89.5	<0.001
Age at Childbirth (4689)										
Under-aged (1215)	25.9	29.6	70.4		5.0	95.0		11.3	88.7	
Middle-aged (3132)	66.8	29.8	70.2	0.771	5.8	94.2	0.323	12.4	87.6	0.187
Over-aged (342)	7.3	31.6	68.4		7.0	93.0		14.9	85.1	
Estimation of Happiness (4689)										
Unhappy (174)	3.7	36.2	63.8	0.063	5.7	94.3	.0985	9.8	90.2	0.307
Happy (4515)	96.3	29.6	70.4		5.7	94.3		12.4	87.6	
Functional Difficulty (4689)										
Difficulty (79)	1.7	35.4	63.6	0.276	3.8	96.2	0.459	15.2	84.8	0.424
No Difficulty (4610)	98.3	29.8	70.2		5.7	94.3		12.2	87.8	
Difficulty Remembering/Concentrating (4689)										
Difficulty (368)	7.8	34.5	65.5	0.043	4.1	95.9	0.158	16.3	83.7	0.014
No Difficulty (4321)	92.2	29.5	70.5		5.9	94.1		11.9	88.1	
Attitude Toward Child										
Child Beating (4689)										
Yes (240)	5.1	47.9	52.1	<0.001	7.9	92.1	0.132	17.1	82.9	0.019
No (4449)	94.9	28.9	71.1		5.6	94.4		12.0	88.0	
Quality Time (4689)										
Absent (2994)	63.9	30.4	69.9	0.305	4.9	95.1	0.002	12.2	87.8	0.771
Present (1695)	36.1	29.0	71.0		7.1	92.9		12.4	87.6	

NS: Not Satisfactory, S: Satisfactory

It is observed from Table 1 that the percentage of male and female respondents are almost equal (51.2% and 48.8%). Most of the children (81.9%) under study are found to reside in the rural area while only 18.1% are urban residents. In the case of region, the highest percentage (20.4%) of respondents belong from Chattogram division

while the second highest one is Dhaka division with 19.6% of respondents. The under-weighted children encompass 24.1% of the respondents and 3.9% of them are found to have overweight. In the context of mother's characteristics, the mothers with secondary-level of education contain the highest percentage (49.4%) of respondents while only 11.6% of the participants' mothers are illiterate. The wealth index shows that 46.3% of the respondents belong to poor family, while 34.9% and 18.8% come from rich and middle-income communities, respectively. Furthermore, 63% of the respondents' mothers are exposed to media. The age at child birth shows the highest percentage (66.8%) of the respondents were born to the mothers at their age range of 19-30 years. The variable estimation of happiness shows that 96.3% of the respondents' mothers are used to be happy. Moreover, most of the respondents' mothers are found to have no difficulty in usual functioning (98.3%) as well as remembering and/or concentrating (92.2%). The covariates of attitude towards children depicted that only 5.1% of the target children are beaten excessively. On the contrary, quality time, reflecting a positive attitude towards children, illustrates that less than half of respondents' (36.1%) parents, family members or caregivers spend quality time with the corresponding children.

Chi-Square test of independence reveals that physical skill development is significantly associated with division, weight of the child, mother's education, wealth index, media exposure, estimation of happiness, and difficulty remembering/concentrating. Table 1 shows that children residing in Khulna division have the highest percentage (78%) of satisfactory PS development, which is followed by Dhaka (76.9%) and Rangpur (75.2%). The weight of the child denotes that 71.8% of the normal-weighted children develop a satisfactory PS. The wealth index depicts that 73.6% of the children from the middle-class family show satisfactory results. 72.6% of the media-exposed mothers have children with satisfactory PS. The children whose mother shows no difficulty are encountered with the higher percentage (70.5%) of PS development. 71.1% of the children who were not beaten excessively have responded satisfactorily in PS development. Among excessively beaten children, only 52.1% illustrates satisfactory PS development.

In case of SS, the covariates like division, weight of the child, mother's media exposure and quality time with child are significantly associated with development of child. Similar to physical skills, children residing in Khulna division show the highest percentage (97.9%) of satisfactory SS development. It also exhibits that 94.9% of the children develop adequately in the social domain whose mothers are exposed to media. 95.1% of the children having no quality time show satisfactory SS development which is higher than the percentage of the children who spent quality time (92.9%) with parents and family members. The reason behind such an ambiguous finding is that majority of the children (63.9%) are observed to spend no quality time according to this data.

Cognitive domain depicted that the children in Dhaka and Khulna division secure the leading position in satisfactory skill development with the percentages of 91.1% and 91.3%, respectively. 88.4% of the normal-weighted children show sufficient development on cognitive skill which is the highest among the three categories of the weight variable. Table 1 reveals that the mothers with education level of higher secondary or more give the best result (89.4%) in the CS development of their children. Majority of the children (90%) from rich family develop CS sufficiently while this percentage remains almost equal for the poor and middle-class families. 88.1% of the children show satisfactory cognitive development whose mothers have no difficulty in remembering/concentrating. Among children not beaten excessively, 88% display satisfactory cognitive development, which is higher compared to that of their counter part.

Multivariate Analysis

Since the response variables have binary outcomes, three binary logistic regression models have been employed to analyze physical, social and cognitive skill development of a child. Results obtained from the regression models are reported in Table 2 for satisfactory PS, SS, and CS development. The significant determinants of physical development are division, weight, wealth index and child beating. Table 2 indicates that the children living in Chattogram have odds ratio 0.434 which depicts $(1 - 0.434) \times 100\% = 56.6\%$ lower odds of developing satisfactory PS compared to those from Dhaka division. Furthermore, Barishal and Mymensingh divisions' children have respectively 27.9% and 43.3% lower odds of having sufficient PS development than those of the children from Dhaka division. These differences in odds ratio are statistically significant (at 5% significance level) since the *p* value obtained for each of these groups is less than 0.05. In contrast to the children with normal weight, the over-weighted and under-weighted children experience respectively 39.8% and 15.3% significantly lower odds of achieving appropriate physical development outcomes. A statistically significant OR of 1.279 for a middle-class family indicates that the odds of adequate physical development for a child from such family is 1.279 times that of the children from the poor family. Children who are not beaten excessively have 109.3% higher odds of satisfactory PS compared to those who are beaten excessively in their day-to-day life.

Table 2. Results of binary logistic regression model depicting odds ratio (OR) and 95% confidence interval (CI) of OR

Variables	Physical Skill (PS)		Social Skill (SS)		Cognitive Skill (CS)	
	OR	95% CI	OR	95% CI	OR	95% CI
Intercept	1.175	(0.783, 1.762)	12.82***	(8.662, 18.973)	4.043***	(2.368, 6.904)
Characteristics of Child						
Division						
Barishal	0.682*	(0.520, 0.896)	1.029	(0.604, 1.754)	0.603**	(0.420, 0.866)
Chattogram	0.434***	(0.354, 0.534)	0.671**	(0.456, 0.987)	0.636**	(0.473, 0.856)
Dhaka (RC)	-	-	-	-	-	-
Khulna	1.040	(0.814, 1.328)	2.465**	(1.342, 4.525)	1.068	(0.746, 1.529)
Mymensingh	0.567***	(0.421, 0.764)	0.609	(0.361, 1.028)	0.718	(0.472, 1.092)
Rajshahi	0.827	(0.638, 1.071)	1.274	(0.745, 2.179)	0.848	(0.585, 1.228)
Rangpur	0.940	(0.730, 1.210)	0.742	(0.479, 1.149)	0.974	(0.675, 1.406)
Sylhet	0.611***	(0.470, 0.795)	0.787	(0.481, 1.290)	0.430***	(0.307, 0.604)
Weight						
Over-weighted	0.602**	(0.441, 0.820)	0.54*	(0.322, 0.903)	0.652*	(0.438, 0.971)
Normal(RC)	-	-	-	-	-	-
Under-weighted	0.847*	(0.730, 0.983)	0.776	(0.584, 1.031)	0.943	(0.767, 1.158)
Characteristics of Mother						
Education						
Illiterate (RC)	-	-	-	-	-	-
Primary	0.978	(0.784, 1.221)	-	-	1.087	(0.811, 1.455)
Secondary	1.137	(0.918, 1.407)	-	-	1.174	(0.881, 1.562)
Higher Secondary	1.218	(0.922, 1.609)	-	-	1.119	(0.766, 1.633)
Wealth Index						
Poor (RC)	-	-	-	-	-	-
Middle	1.279**	(1.060, 1.544)	-	-	0.98	(0.763, 1.26)
Rich	1.094	(0.915, 1.308)	-	-	1.228	(0.953, 1.581)
Media Exposure			-		-	-
Unexposed (RC)	-	-	-	-	-	-
Exposed	1.096	(0.945, 1.272)	1.31*	(1.007, 1.703)	1.236	(1.008, 1.516)
Difficulty Remembering/Concentrating						
Difficulty (RC)	-	-	-	-	-	-
No Difficulty	1.192	(0.944, 1.506)	-	-	1.336	(0.988, 1.807)
Attitude Towards Child						
Child Beating						
Yes (RC)	-	-	-	-	-	-
No	2.094***	(1.594, 2.750)	-	-	1.398	(0.975, 2.005)
Quality Time						
Absent (RC)	-	-	-	-	-	-
Present	-	-	1.581***	(1.225, 2.04)	-	-

RC: Reference Category, *: $p<0.05$, **: $p<0.01$, ***: $p<0.001$

Table 2 also shows the results of binary logistic model for SS development where the significant associations are found for the covariates of division, weight, media exposure and quality time spent with child. Chattogram and Khulna divisions result in the ORs of 0.671 and 2.465, respectively. This finding reveals that children residing in Chattogram and Khulna divisions undergo respectively 32.9% significantly lower odds and 146.5% significantly higher odds of developing SS up to a satisfactory level compared to the Dhaka division's children. The model also shows that

the over-weighted children have 46% significantly lower odds of developing proper social skills compared to the children encountered with normal weight. The mother's media exposure leads to a 31% higher (statistically significant) odds of the healthy SS development among their children compared to those from the unexposed mothers. The odds of sufficient social development among children who have quality time in their daily life are 1.581 times that of their counterpart.

The findings of the CS-development oriented binary logistic regression model are presented in Table 2. Division, weight, and media exposure are found to have significant association with child's CS development based on the *p* values of the model. The model findings indicate that the children living in Barishal, Chattogram and Sylhet have respectively 39.7%, 36.4% and 57% significantly lower odds of developing satisfactory CS compared to the children of Dhaka division. The odds of satisfactory cognitive development for the over-weighted children are 0.652 times (statistically significant) that of the children with normal weight.

All the findings interpreted above considered that the covariates other than the corresponding one are kept at a fixed level.

IV. Discussion and Conclusion

The development phase between 36 to 48 months is crucial for children since they exhibit remarkable growth in various domains during this time period. This study has observed how important it is to provide a supportive environment for child that encourages exploration and learning during this phase. Moreover, it emphasizes on how attitude towards children in the early years (36 to 48 months) helps in shaping various spheres of development.

Between the two attitude-related covariates, excessive beating of child showed significant association with satisfactory physical development. The higher odds of appropriate physical development occur for the children who are not beaten compared to those who are exposed to excessive child beating. In fact, compared to the non-abused children, the children whose first abuse occurred within 2 years of their birth were found to have a higher chance of vulnerability in three or more developmental areas[22]. This excessive beating may come as a form of physical punishment which leads to permanent injury along with scaring a child. Such injury may lead to physical incompetence in many cases and impede physical development[23]. On the other hand, spending quality time with children is an important factor for the growth of their social skills at an early age. Playing with children, reading books with them, taking them outside and helping them to initiate interaction with others help to improve their social skills. The quality time provides happy moments to a child's life, which is essential for the development of its brain. Furthermore, a happy childhood makes a child feel safe, secure, loved, and confident enough to open up as a great social individual from its early childhood period[24]. Moreover, this attitude may help them adjust well in their pre-schools and other upcoming educational institutions. However, the attitude towards children shows no significant effect on the cognitive development of children at their early ages.

Division shows significant impact on all three skills of child (physical, social, cognitive). It reflects how regional variations, geographical differences, food habits, cultures, and upbringing of children differs in various divisions. Sylhet division depicted lower odds of physical and cognitive development of children compared to the children in Dhaka division. Again, Khulna division was found with the higher odds of SS development compared to those of Dhaka division. Both the under-weighted and over-weighted children had lower odds of growing adequate PS compared to the children with normal weight. On the contrary, only the over-weighted children revealed significant and negative association with social and cognitive skill development. Due to physical constraints, over-weighted children may be unable to participate in active play or sports with other kids. As a result, they spend less time with other kids, which affects their social skills. Wealth index showed significant association with the physical skill development of children. Petterson & Albers[25] found a positive correlation between wealth level and children's mental and physical growth. In fact, households with low incomes are more likely to have dietary deficiencies leading to an inadequate physical growth. Similar result is also found in our model where a middle-class family's odds of development is higher than that of a poor family. Mothers belonging to middle class families can afford more nutritious foods, playthings, spacious living for their children compared to the mothers from poor wealth index. On the other hand, the children from rich community being prone to the device addiction and obesity cannot develop physical skills satisfactorily as do the children from the middle-class families. Findings from this work explains that media exposure of mother influences the social skill development of child. Mothers exposed to media remain more aware of their children's achieving milestones according to their age and are more

inclined to improve their children's skills with the help of well-designed child development programs.

Practical Implications

On the basis of the findings of this project, some recommendations are suggested so that the policymakers can increase consciousness about early childhood skill development in Bangladesh. Firstly, preventive programs against child abuse or excessive beating should be popularized by creating awareness among parents and other family members about its drawbacks. The family counselling and regular home visits of counsellors and trained child care givers can help parents to discipline their children thoughtfully. Parents, family members and care givers should be trained how to nurture children in an appropriate way and solve conflicts without hitting or yelling. Quality time impacts the parent-child relationship which ultimately affects the social and emotional development of children. The child-centered play and different play activities should be encouraged by different early childhood development programs. It helps to ensure spending specific time of a day with children by giving them attention and independence simultaneously. For the under-weighted children, nutritional counselling and diet planning should be arranged in various campaigns. Conversely, healthy diet should be followed and sedentary activities should be reduced for longer periods to minimize the prevalence of over-weight among children. Mothers' media exposure should be increased as it showed higher odds of childhood skill development in all the three domains. Visionary mass media campaigns and public health programs on early childhood development should be arranged for mothers.

Future Scope

Since division showed significant association with the early skill development of child, further analysis can be done by clustering of samples based on divisions using multilevel logistic regression model. Further studies can be designed to encompass the repeated measures on the selected variables.

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